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Department Overview
2005-06

We were extremely pleased to welcome Dr. Peng Liu to our faculty in fall 2006 as a new assistant professor. Dr. Liu received her PhD from Cornell University and will provide us with additional expertise in bioinformatics, genomics and statistical methodology in the nutritional sciences. We were also very pleased to secure a permanent lecturer position for Dr. Ulrike Genschel. Dr. Genschel earned a PhD in Statistics from Dortmund University, and she made significant contributions to undergraduate teaching as a temporary lecturer last year. She will coordinate the teaching of the first two courses in business statistics. The undergraduate program continues to slowly increase in numbers. The graduate program was strengthened by a five-year NSF VIGRE grant that recently came to an end. Our new Research Training Grant from the National Science Foundation had generated interest in the application of statistics in the engineering and physical sciences and has helped to develop relationships with corporate and government research labs.

The most significant event of the past year was the external review of our program conducted in spring 2006. The Department spent six months reviewing achievements of the past seven years and planning for the future. A written report was submitted to the review team in March, 2006, and the team visited the Department for three days in April. The review team submitted their final report in June. This was a very thorough assessment of our research, teaching, service and consulting missions that focused on identifying priorities and recommending actions to enhance our standing among the top statistics programs. The review team recognized the international prominence of the research and graduate programs in Statistics and the vital contributions that the Department of Statistics makes to innovative teaching of statistics at both the undergraduate and graduate level, providing statistical support for research in a wide variety of disciplines, and actively participating in collaborative research. In recent years the Department of Statistics has been extremely successful in obtaining external support for both research in statistics and collaborative research in the engineering, biological, environmental, agricultural, and behavioral sciences. A recent NSF study ranks the mathematical sciences program at ISU among the top ten in the country with respect to research funding obtained from federal research institutes.

Three major recommendations for maintaining the quality of the Statistics program were made: reestablish competitive salaries, address the deteriorating condition of Snedecor Hall, and provide better support for dual careers. We are pleased to report that the University has already taken substantial action to address these issues. Over the last decade, salaries for senior and mid-career faculty have fallen considerably below our peer institutions, making it difficult to recruit and retain top faculty. The Department of Statistics was able to compete for a special pool of money for faculty salary increases in May 2006. This has provided a good first step toward achieving competitive salaries, but more needs to be done in the immediate future to retain key faculty. Dual career accommodations have become an increasingly important issue in faculty recruitment and retention. The Provost has recently hired a new staff member to assist with faculty retention issues, and plans are being discussed for better accommodating dual faculty careers.

President Geoffroy announced in May 2006 that Snedecor Hall would be completely renovated. This was extremely welcome news because the deteriorating condition of Snedecor Hall was creating serious problems for the academic quality of the program. Air conditioning
and plumbing systems have not worked properly for years and there were severe shortages of office and meeting spaces. We have literally housed graduate students in closets. The faculty, staff and students have already devoted many hours working with ISU facilities planners and an outside architectural firm on the renovation design. The program will be temporarily relocated to Wilson Hall, an unused dormitory, in December 2007, and the renovation is scheduled for completion in May 2009. Unfortunately, our program has grown too large to fit in Snedecor Hall and we have been unable to raise sufficient private donations to construct an addition on the west side of the building. Consequently, CSSM will be moved to the ISU Research Park and one instructional lab will be located in Carver Hall until an addition can be built. The renovation of Snedecor Hall was designed to accommodate a west side addition in the future.

Academic issues were also thoroughly considered by the review team and the following recommendations were made: (1) Hire at least one additional senior or mid-career faculty to provide better balance in statistical theory and help mentor the junior faculty hires. (2) Explore the creation of a Center for Engineering Statistics within the Statistical Laboratory to provide more visibility for current research efforts and promote new collaborative projects with ISU Research Centers, the Ames Lab, and external corporate and government partners. (3) Build greater expertise in computational methods by hiring faculty and recruiting graduate students with strong interest in developing computational tools to address important theoretical issues and address the rapidly changing demands for new statistical methodologies in the engineering, genomics and the biological and environmental sciences. (4) Recognize that the success that statistics faculty has achieved in grant supported collaborative research in genomics, nutrition, agricultural, biological and environmental sciences has deeply reduced the time they have available for statistical consulting and graduate student advising that they have long provided for researchers in the College of Agriculture and the Experiment Station. Strategies for dealing with the increased workload resulting from this success must be discussed with the College of Agriculture. (5) Develop strategies to re-energize the research program in spatial statistics and other methodologies for the environmental sciences to help address important problems in precision agriculture, soil science, climate change and related ecological issues. (6) The Center for Survey Statistics and Methodology (CSSM) is an important component of the Department of Statistics and the Statistical Laboratory that has made fundamental contributions to how the U.S and many other nations conduct agricultural and natural resource studies. The review team found that CSSM is well positioned to take advantage of this traditional expertise in the future and endorsed new CSSM proposals to expand collaborations with researchers and centers in the social and behavioral sciences, including the proposed Center for Rural Population Studies.

With respect to undergraduate education, the review team reported that “the Statistics Department at ISU teaches virtually all statistics courses on campus. It is highly commendable that ISU does not view teaching as a ‘burden’ but rather as a welcome responsibility – one that will lead to a better educated society that uses statistical concepts and methods effectively for improved decision making in industry, government and academia.” The ability to provide high quality instruction to a large number of students and maintain a high level of student satisfaction is due, in large part, to having a few faculty members devoted to research in statistic education and dedicated to supervising our undergraduate teaching mission. The “professor in charge” system for managing multi-section, large enrollment service courses in statistics ensures quality and consistency and also provides a process for developing teaching skills of graduates students and faculty who participate in teaching sections of those courses. This group is also contributing to K-12 education in the state by developing courses for improving the statistics training of mathematics education majors and in-service high school teachers. The review team strongly recommended hiring one more senior faculty member to participate in these important duties and help develop the program in statistics education.
Changes in the graduate program were made seven years ago as part of our successful NSF VIGRE proposal. This program provided momentum to substantially increase the proportion of PhD students in our program, especially among U.S citizens. We agree with the review team recommendation that this is an appropriate time to undertake a systematic assessment of the merits and weaknesses of the revised curriculum. The review team expressed some concern with the lack of a formal consulting course. We currently provide meaningful consulting experiences to many students through research assistantships with the Agriculture Experiment Station and a wide variety of grant supported experiences that embed our students in collaborative research projects with on-campus and off-campus researchers. In recent years, Mark Kaiser has offered a case study course to PhD students. We will further consider how we can better provide meaningful consulting training and experiences to all graduate students. Finding adequate office space for our graduate students has been a long standing problem that will finally be addressed with the renovation of Snedecor Hall.

The Department of Statistics teaches an extensive set of 400 level courses in statistics that are primarily aimed at providing skills in the design and analysis of research studies for graduate students in other disciplines. Graduate students from other disciplines also frequently enroll in our 500 level courses. We will meet with directors of graduate studies, interdisciplinary program directors, and other interested faculty to review how well these course offerings meet the needs of other graduate programs. Our primary objective is to provide the highest quality instruction with minimal duplication.

The Department also needs to re-evaluate the role of distance education in its mission. The review team recommended “For the Department to continue the distance education degree program, the College and the University must make a commitment on resources (at least in the short run until it becomes profitable), adequate marketing and administrative support for the program, and coordination with other distance education programs.” As the University moves to a new budget model in 2009, Extension will relinquish supervision of distance education to the Colleges. As College missions in distance education develop, the Department of Statistics will carefully examine opportunities in the context of its mission and strategic plan.

The Department will seek to improve computing resources for research by pooling Department and faculty resources to create a shared computing cluster. We have recently installed a storage device to provide automatic backup for faculty and staff computers and large amounts of secured storage for department information. Faculty and students can use this device to safely store electronic documents, data and research results. We will continue to improve our electronic systems and staff training for storing and retrieving department information. This will especially important as we prepare for a new university budgeting procedure that will impose greater budget responsibilities and demand for information on departments and colleges.

Overall the Department of Statistics and the Statistical Laboratory are well positioned for the future. We have been fortunate to hire some excellent young faculty in the past few years and we have recently recruited some of our strongest cohorts of graduate students. The undergraduate program is experiencing steady growth. With the upcoming renovation of Snedecor Hall, it is an exciting time to be part of the Statistics program at ISU.

Kenneth J. Koehler,
Chair of the Department of Statistics and
Director of the Statistical Laboratory
PERSONNEL

New Personnel

(Pictured left to right: Ghosh, Genschel, Kafadar, Yu and Nordman)


Ghosh, Arka (8/2005). Assistant Professor. PhD from the University of North Carolina, Chapel Hill (2005). Research interests include applied probability, stochastic processes, stochastic control theory, stochastic modeling for networks and internet traffic, heavy traffic analysis and time series analysis.

Kafadar, Karen (8/2005). Professor, Baker Chair for Bioinformatics and Biological Statistics. PhD from Princeton University (1979). Research interests include robust methods and exploratory data analysis with applications to physical and biological sciences, statistical methodology for spatial data with applications in epidemiology, statistical graphics and visual displays of quantitative information, instrument performance and measurement processes, and statistical methodology for randomized cancer screening trials.


Nordman, Daniel (8/2005). Assistant Professor. MS and PhD from Iowa State University (1999, 2002). Research interests include empirical likelihood, long-range dependence, resampling/subsampling methodology and spatial statistics. Dan received Excellence awards in Teaching, Research and Consulting, as well as the George W. Snedecor Award for the most outstanding PhD candidate in statistics for the year 2000.


Emeritus Faculty
Cox, C. Philip, Professor Emeritus
Cox, David F., University Professor Emeritus
David, Herbert A., Distinguished Professor Emeritus
David, Herbert T., University Professor Emeritus
Fuller, Wayne A., Distinguished Professor Emeritus, Center for Survey Statistics and Methodology (CSSM)
Groeneveld, Richard A., University Professor Emeritus
Harville, David A., Professor Emeritus
Hickman, Roy D., Professor Emeritus
Hinz, Paul A., University Professor Emeritus
Hotchkiss, Donald K., Professor Emeritus
Pollak, Edward, Professor Emeritus
Strahan, Robert F., Professor Emeritus
Sukhatme, Shashikala B., Associate Professor Emerita
Wolins, LeRoy, Professor Emeritus

Professors
Athreya, Krishna B., Distinguished Professor, Joint appointment (Department of Mathematics)
Bailey, Theodore B.
Bonett, Douglas G., Joint appointment (Department of Psychology Chair)
Brendel, Volker, Courtesy appointment (Department of Genetics, Development and Cell Biology)
Carriquiry, Alicia L., Co-Director of Graduate Education
Chen, Song X.
Cook, Dianne H.
Dixon, Philip M.
Isaacson, Dean L., Co-Director of Graduate Education
Kafadar, Karen, Laurence H. Baker Chair of Biological Statistics
Kaiser, Mark S.
Kennedy Jr., William J.
Kochler, Kenneth J., University Professor, Chair of the Department, Director of the Statistical Laboratory
Lahiri, Soumendra N.
Lorenz, Frederick O., University Professor, Joint appointment (Department of Sociology)
Meeker Jr., William Q., Distinguished Professor
Morris, Max D., Joint appointment (Dept. of Industrial and Manufacturing Systems Engineering)
Nusser, Sarah M., CSSM
Shelley II, Mack C., University Professor, Joint appointment (Department of Educational Leadership and Policy Studies)
Stephenson, W. Robert, University Professor
Vardeman, Stephen B., University Professor, Joint appointment (Department of Industrial and Manufacturing Systems Engineering)
Associate Professors
Maiti, Tapabrata (Taps), CSSM
Maitra, Ranjan
Marasinghe, Mervyn G.
Nettleton, Daniel S.
Opsomer, Jean D., CSSM Director
Roberts, Carl W., Joint appointment (Department of Sociology)
Rollins Sr., Derrick K., Joint appointment (Department of Chemical Engineering)
Sherman, Peter J., Joint appointment (Department of Aerospace Engineering and Engineering Mechanics)
Wu, Huaiqing

Assistant Professors
Adams, Dean C., Courtesy appointment (Department Ecology, Evolution and Organismal Biology)
Caragea, Petruta C.
Dorman, Karin S., Joint appointment (Department of Genetics, Development & Cell Biology)
Duckworth II, William M.
Evans, Richard B., Courtesy appointment (College of Veterinary Medicine)
Froelich, Amy G.
Ghosh, Arka
Hofmann, Heike
Huang, Tzee-Ming
Larsen, Michael, CSSM
Liu, Peng
Nordman, Daniel
Peng, Liang
Yu, Cindy

Lecturers
Bhattacharyya, Jahnabimala (Juri), Lecturer
Genschel, Ulrike, Lecturer

Faculty Collaborators
Amemiya, Yasuo
Sargent, Daniel J., Mayo Clinic
Sloan, Jeff A., Mayo Clinic
Therneau, Terry M., Mayo Clinic

Visiting Faculty
**USDA Collaborators**

Dayton, Bob, USDA Natural Resources Conservation Service  
Lessard, Roni, USDA Natural Resources Conservation Service  
Thompson, Dean, USDA Natural Resources Conservation Service  
Wilson, Herb, USDA Natural Resources Conservation Service

**Postdoctoral Research Associate**

Collyer, Michael L.

**Professional and Scientific Staff**

Anderson, Dianne, Assistant Director, CSSM  
Anderson, Linda, Systems Analyst I, CSSM  
Bell, Andrew, Manager Information Technology II, CSSM  
Butler, Howard, Systems Analyst III, CSSM  
Dorsch, Richard, Systems Analyst III, CSSM  
Dotts, Alan, Systems Analyst III, CSSM  
Fliehler, Karen, Program Assistant II, CSSM  
Hanrath, Scott, Systems Analyst II, CSSM  
Hoffman, Russ, Systems Support Specialist IV, CSSM  
Kazemi, Masoud, Systems Analyst III, CSSM  
Kienzler, Jim, Associate Scientist, CSSM  
Krueger, Todd, Systems Analyst III, CSSM  
Landin, Edith, Administrative Specialist  
Larson, Jan, Program Coordinator III, CSSM  
Peterson, C. Ted, Systems Analyst II, Statistical Laboratory  
Reed-Margetan, Deborah, Systems Analyst III, CSSM  
Rogers, Marc, Systems Analyst II, CSSM  
Sammis, Chris, Analyst/Programmer, CSSM  
Shelley, Kathy, Systems Analyst III, Statistical Computing  
Smith, Sandie, Administrative Specialist I, CSSM  
Terpstra, Harvey, Systems Analyst III, CSSM  
Tyler, Allison, Program Coordinator I, CSSM  
Vardeman, Andrew, Systems Analyst I, CSSM  
Zengin, Ozkan, Assistant Scientist, CSSM

**Support Staff**

Ashley, Glenda, Secretary II, CSSM  
Elwick, Norma, Secretary II  
Heathman, Nancy, Account Specialist, CSSM  
La Grange, Jeanette, Clerk Typist III  
Martinez, Sherri, Secretary II  
Reinertson, Kathie, Data Tech III, CSSM  
Riker, Denise, Secretary II  
Shepard, Sharon, Clerk Typist III  
Tjernagel, Marlene, Account Clerk
# Students

## Graduates

<table>
<thead>
<tr>
<th>Name</th>
<th>Graduation</th>
</tr>
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<tbody>
<tr>
<td>Botts, Carsten</td>
<td>Summer 2005</td>
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<tr>
<td>Camano-Garcia, Gabriel</td>
<td>Summer 2006</td>
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<tr>
<td>Chen, Lihua</td>
<td>Summer 2005</td>
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<td>DeCook, Rhonda</td>
<td>Summer 2006</td>
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<td>Esker, Paul</td>
<td>Fall 2005</td>
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<td>Heilmann, Cory</td>
<td>Fall 2005</td>
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<td>Jiang, Qi</td>
<td>Summer 2006</td>
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<td>Jovaag, Kari Ann</td>
<td>Summer 2006</td>
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<tr>
<td>Legg, Jason</td>
<td>Fall 2006</td>
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<tr>
<td>Leyva-Estrada, Norma</td>
<td>Summer 2006</td>
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<tr>
<td>Li, Xiaoxi</td>
<td>Fall 2006</td>
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<td>Love, Tanzy</td>
<td>Summer 2005</td>
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<td>Miller, Curtis</td>
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<td>Mukhopadhyay, Pushpal</td>
<td>Summer 2006</td>
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<td>Recknor, Justin</td>
<td>Fall 2006</td>
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<td>Wang, Dong</td>
<td>Spring 2006</td>
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<td>Wang, Yaqin</td>
<td>Fall 2006</td>
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<td>Wang, Yurong</td>
<td>Spring 2006</td>
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<td>Wu, Han</td>
<td>Summer 2006</td>
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<td>Xu, Xia</td>
<td>Spring 2006</td>
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<td>Zhai, Dongmei</td>
<td>Summer 2005</td>
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<td>Zhang, Xiaohong (Alicia)</td>
<td>Fall 2006</td>
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<td>Zhou, Zhigang</td>
<td>Fall 2005</td>
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## MS Graduates

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<td>Adair, Joseph</td>
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<td>Bai, Hong</td>
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<td>Barclay-Sisson, Kira</td>
<td>Summer 2005</td>
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<td>Baumann, William</td>
<td>Summer 2006</td>
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<td>Blabac, Eric</td>
<td>Summer 2005</td>
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<td>Borrowman, Gina</td>
<td>Summer 2006</td>
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<td>Buzinec, Paul</td>
<td>Summer 2005</td>
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<td>Cao, Xueyuan</td>
<td>Fall 2006</td>
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<td>Chapman, Jessica</td>
<td>Spring 2006</td>
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<td>Chen, Yuan-Lin</td>
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<td>Chung, Oi-Yu</td>
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<tr>
<td>Crowson, Cynthia (Distant Ed)</td>
<td>Fall 2005</td>
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<td>Duan, Zhaoyang</td>
<td>Summer 2005</td>
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<td>Eshenko, Ihor</td>
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<td>Fan, Xing</td>
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<td>Fang, Shu-Ann</td>
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<td>Fredericksen, Zachary</td>
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<td>Gao, Chunwang</td>
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July 1, 2005-December 31, 2006
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<td>Ji, Yulin</td>
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<td>Lahr, Brian (Distant Ed)</td>
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<td>Larson (Morrow), Gabrielle</td>
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<td>Li, Lanfen</td>
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<td>Li, Wen</td>
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<td>Lu, Lu</td>
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<td>Mueller, Kim</td>
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<td>Nguyen, Justin</td>
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<td>Nirelli, Liza</td>
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<td>Pan, Jiangyi</td>
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<td>Qin, Yingli</td>
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<td>Qiu, Fang</td>
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<td>Shang, Wenzhuo</td>
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<td>Shukla, Sachet</td>
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<td>Sun, Junjie</td>
<td>Spring 2006</td>
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<td>Wang, Jianqiang</td>
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<td>Xiang, Qun</td>
<td>Fall 2005</td>
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<td>Yang, Lei</td>
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<td>Yue, Chengyan</td>
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<td>Yum, Man-Yu</td>
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<td>Zhang, Yi</td>
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<td>Spring 2006</td>
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<td>Fall 2006</td>
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<td>Zhuang, Weihong</td>
<td>Summer 2005</td>
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**BS Graduates**

<table>
<thead>
<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Abbey, James</td>
<td>Summer 2005</td>
</tr>
<tr>
<td>Choi, Hyun “Ken”</td>
<td>Fall 2006</td>
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<tr>
<td>Howard, Reka</td>
<td>Spring 2006</td>
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<tr>
<td>Hung, Ling</td>
<td>Fall 2006</td>
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<tr>
<td>Knoke, Katherine (Junge)</td>
<td>Fall 2006</td>
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<td>Li, Hang</td>
<td>Summer 2006</td>
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<td>Merrick, Courtney</td>
<td>Spring 2006</td>
</tr>
<tr>
<td>Min, Jun Young</td>
<td>Summer 2005</td>
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</tbody>
</table>
Current Students

PhD Students

ABBIE, James (USA)
ALF, Cherie (USA)
BANDYOPADHYAY, Soutir (India)
BELL, Amanda (USA)
BERG, Emily (USA)
BEVERLIN, Lucas (USA)
BEYLER, Nicholas (USA)
BINGHAM (Mayers), Melissa (USA)
BOTT, Carsten (USA)
CAMANO-GARCIA, Gabriel (Uruguay)
CHAPIN, Patrick (USA)
CHAPMAN (CHISHAM), Jessica (USA)
CHATTERJEE, Arindam (India)
CHEN, Lihua (China)
CHEN, Wei-Chen (Taiwan)
CLAVERIA, Michael (USA)
CRAFT, Jeremy (USA)
CRINER, Emmanuel (USA)
DANCIK, Garrett (USA)
DAS, Ujjwal (India)
DAWSON, Erica (USA)
DeCOOK, Rhonda (USA)
DEMIRKALE, Cumhur (Turkey)
DIAO, Lixia (China)
ERICKSEN, Anna (USA)
ESHENKO, Ihor (Ukraine)
ESKER, Paul (USA) co-major: Plant Pathology
FAIRCHILD, Jennifer (USA)
GAO, Chunwang (China)
GARDNER, Stuart (USA) co-major: Interdepartmental Microbiology
GRAHAM, Rachel (USA)
HALVORSEN, Andrew (USA)
HE, Wei (China) co-major: Animal Science
HEILMANN, Cory (USA)
HEWITT, Kyle (USA)
HOBBS, Jonathan (USA)
HOEKSEMA, Amy (USA)
HONG, Yili (China)
HOBBS, Reka (USA)
HUANG, Ling (China)
HUARNG, Shiaau-er (Taiwan)
JIANG, Qi (China) co-major: Industrial Education and Technology
JOSEPH, Maria (USA)
JOVAAG, Kari (USA) co-major: Ecology and Evolutionary Biology
JUNG, Tony (USA)

KIES-BOKENKROGER, Courtney (USA)
KIM, Min Sun (Korea)
KIM, Young Min (Korea)
KISCH, Wendy (USA)
KRAEMER, Kari (USA)
LARSON, Nicholas (USA)
LAWRENCE, Michael (USA)
LEGG, Jason (USA)
LEYVA-ESTRADA, Norma (Mexico)
LI, Lanfen (China)
LI, Wen (Shirley) (China)
LI, Xiaoxi (China)
LIANG, Kun (China)
LIU, Zhe (China)
LOVE, Tanzy (USA)
LU, Lu (Emma) (China)
LU, Zheng (China)
LUND, Steven (USA)
MA, Haiming (China)
MCCONVILLE, Teresa (USA)
MCKELVEY, Mark (USA)
MELNYKOV, Volodymyr (Ukraine)
MILLER, Curtis (USA)
MOSLEY, Lawrence (USA)
MUELLER, Kim (USA)
MUKHOPADHYAY, Pushpal (India)
NAVARRRO-VILLARIOEL, Claudia (Chile) co-major: Educational Leadership and Policy Studies
ORELLANA, Massiel (Chile) co-major: Agronomy
ORR, Megan (USA)
OTT, Ellis (USA) co-major: Educational Leadership and Policy Studies
PAGE, Garritt (USA)
PAIK, Min Hui (Korea)
PAUL, Matthew (USA)
PAZDERNIK, Karl (USA)
PINTAR, Adam (USA)
PLATT, Stephanie (USA)
QU, Long (China) co-major: Bioinformatics and Computational Biology
RAJARAM, Misha (India)
RAMLER, Ivan (USA)
RECKNOR, Justin (USA) co-major: Bioinformatics and Computational Biology
REINERS, Jostein (USA)
REISING, Monica (USA)
REMBERT, Nicole (USA)
RIDDLES, John (USA)
ROCKHOFF, David (USA)
SI, Yaqing (China)

July 1, 2005-December 31, 2006
TANG, Chengyong (China)
TESSIN, Dale (USA) *co-major: Ecology and Evolutionary Biology*
TRAPP II, Allen (USA)
VACA TRIGO, Iliana (Ecuador)
VILLANUEVA-MORALES, Antonio (Mexico)
WANG, Dong (China)
WANG, Yaqin (China)
WANG, Yurong (China)
WEAVER, Brian (USA)
WICKHAM, Hadley (New Zealand)
WU, Han (China)
WU, Yu (China)
XU, Xia (China)
YANG, Shan (China)
YOU, Lifeng (China)
YUM, Man-Yu (Hong Kong)
Zhai, Dongmei (China)
Zhang, Wuyan (China) *co-major: Bioinformatics and Computational Biology*
Zhang, Xiaohong (Alicia) (China)
Zhang, Zhan (China)
Zhou, Ming (China)
Zhou, Zhigang (China)
Zoh, Roger (USA)
Zuo, Jianying (Angela) (China) *double degree: Business Administration*

**MS Students**

Adair, Joseph (USA)
Bai, Hong (China)
Bancroft, Timothy (USA)
Barclay-Sisson, Kira (USA)
Baumann, William (USA)
Birkmeier, Dominio (Germany)
Blabac, Eric (USA)
Borrowman, Gina (USA)
Buzinec, Paul (USA)
Cai, Weiguo (China)
Campbell (Boe), Kathryn (USA)
Cao, Xueyuan (China)
Cena, Lorenzo (Italy)
Chen, Dong (China)
Chen, Yuan-Lin (Rita) (Taiwan)
Choi, Kwang Shin (So. Korea)
Chung, Oi-Yu (JoJo) (Hong Kong)
Duan, Zhaoyang (China)
Faden, David (USA)
Fan, Xing (China)
Fang, Shu-Ann (Taiwan)
Fredericksen, Zachary (USA)
Gaio, Xiang (China)
Gil-Sagas, Esteban (Chile)
Gustafson, Kathleen (USA)
He, Jie (China)
He, Wensheng (China)
Hoffman, Derek (USA)
Huckett, Jennifer (USA)
Hugen, Dirk (USA)
Ji, Yulin (China)
Jiao, Jian (China)
Jones, Benjamin (USA)
Larson (Morrow), Gabrielle (USA)
Lavelle, Bridget (USA)
Li, Wenqing (China)
Li, Xuehui (China)
Li, Ying (China)
Lu, Dingding (China)
Macke, Patrick (USA)
McIllece, Justin (USA)
Nguyen, Justin (USA)
Nirelli, Liza (USA)
Pan, Jiangyi (China)
Qin, Yingli (China)
Qi, Fang (China)
Quan, Peter (USA)
Schmidt, Kristian (Germany)
Shaffer, Philip (USA)
Shang, Wenzhuo (China)
Shi, Ying (China)
Shukla, Sachet (India)
Su, Wenyu (China)
Sun, Junjie (China)
Vasile, Athena (Romania)
Volkers, Gisela (Germany) (Dortmund)
Wang, Cuiwei (China)
Wang, Jianqiang (China)
Wen, Shi (China)
Xiang, Qun (China)
Yan, Aimin (China)
Yang, Lei (China)
You, Hai-Qing (Helen) (China)
Yue, Chengyan (China)
Zhang, Shu (China)
Zhang, Xiaoli (China)
Zhang, Yi (China)
Zhang, Zhou (China)
Zhu, Jianhua (China)
Zhu, Jie (China)
Zhuang, Wei (China)
MS Distance Education Students

3M
GRYSKIEWICZ, Mark P.
GUNDALE, Jeremy
RESCH, Walter
VALLEJO, Janet

EADS Space Transportation
PREUSS, Axel
STRUNZ, Richard

Mayo Clinic
CROWSON, Cynthia
FREDERICKSEN, Zachary
LAHR, Brian
MCMURTRY, Erin
O'BYRNE, Megan
SMITH, Denise
WAMPFLER, Jason
ZHAO, Cathy
ZHUANG, Weihong

MetroHealth
THAKORE, Nimish

Wells Fargo
McCALL, David

BS Students
ALDERIN, Corey B.
APPLEBEE, Gregory
BITTNER, Karen
CHEN, Hung-Yun
CHOI, Hyun
CHOU, Yeh-Hung
CULHANE, Jessica
FAN, Bing
GRITTMAN, Derek
HANSON, Keith J.
HICKEY, Kara
HOWARD, Reka
HUGHES, Jill
HUNG, Ling
KIELION, Christopher
KNOKE (JUNGE), Katherine A.
KUNIZAWA, Hideki
LAMBERT, Matthew
LEE, Sang Joon
LEE, Seung-Gyu
LI, Hang
LI, Yi
LIN, Mingzhu
MARTIN, Robert
MARTIN, Ryan T.
MERRICK, Courtney
MINNIS, Kimberly
NIERKORN, Jonathan
OLSON, David
OLSON, Krista
OLSON, Timothy
PENG, Lili
PRIEBE, Lindsey
REES, Donald
RYAN, Christopher
SHELL, Amy
SHERMAN, Phillip J.
SUMMERS, Michael
TSAI, Wei-Chih
TSE, Vivien
DEPARTMENTAL NEWS

New Students Fall 2005

On Friday, August 19th, 2005, Professors Dean Isaacson and Alicia Carriquiry welcomed 22 new MS and PhD graduate students to the Statistics Department. Of the 22 new graduate students, 16 students plan to pursue a PhD in statistics. Ten of the 16 PhD students are VIGRE Fellows.

Fall Picnic 2005

The annual fall picnic was held at Emma McCarthy-Lee Park, September 18th. Big kids and little kids enjoyed the beautiful afternoon playing, eating and visiting with friends from Snedecor. The meal was catered from Hickory Park and picnickers brought a variety of desserts to share. There were 106 students, staff, faculty, friends, and their families that attended.

The social committee members for both the fall picnic and spring breakfast were: Dan Nettleton (Chair), Walt Adair, Juri Bhattacharyya, Doug Bonett, Petruta Caragea, Dick Dorsch, Ben Jones, Jeanette La Grange, Edith Landin and Marlene Tjernagel.
Renovations Begin

The Statistics Department had contacts from ISU Facilities Planning and Management (FP&M), the Office of the Provost, LAS Dean Whiteford and the ISU Foundation about the renovation and expansion of Snedecor Hall. Consequently, after 20 years of neglect, the process of identifying the facilities' needs for the future was gathered. Renovation Committee: Alicia Carriquiry, Dean Isaacson, Edith Landin, Dan Nettleton, Jean Opsomer and Ken Koehler.

The remodeling of the ladies restroom was the result of a memo sent to FP&M in October, 2004, stating the poor conditions of the women's restroom, listing many of the problems and requesting that FP&M refurbish the restroom with the use of university infrastructure funds. Renovations began in September, 2005. Also in September and October, while work was being done on the second floor women's restroom, Snedecor received a much needed new roof.

STATers 2005

“it has been another busy year for STATers. There were many seminars hosted by Vice President Katie Gustafson. The purpose of these seminars was to show students the diversity of job opportunities in the field of statistics. The social committee did a great job in planning and organizing our annual Halloween and Super Bowl parties along with other departmental events. We have celebrated birthdays and have seen the effects of random sampling when some of us have been randomly selected to bring the cake. We have been involved in service projects as we have collected food for the Food Bank and will be in the University-wide effort in helping build playground equipment for a school that does not have any. For this year's fundraiser, STATers voted on a new design for a mug. Many of us are excited to put another year behind us." Gina Borrowman, President
STATers Officers 2005:

Gina Borrowman ....................................................................................................... President
Katie Gustafson ........................................................................................................ Vice President
Ivan Ramler ............................................................................................................... Treasurer
Andrew Halvorsen .................................................................................................... Secretary
Gina Borrowman, Jessica Chapman ........................................................................ Birthday Coordinators
Rachel Graham ........................................................................................................ Community Service Coordinator
Emily Berg, Derek Hoffman ................................................................................. First Year Representatives
Gina Borrowman, Katie Gustafson, Andrew Halvorsen ........................................... GPSS Representatives
Dirk Hugen ............................................................................................................. International Committee Chair
Tim Bancroft ............................................................................................................ Intramural Coordinator
Will Baumann .......................................................................................................... Recycling Coordinator
Jen Huckett ............................................................................................................... Social Committee Chair
Hadley Wickham ..................................................................................................... Webmaster
Petruta Caragea, Mike Collyer ................................................................................ Co-Faculty Advisors

Winter Holiday Party 2005

The Department held its annual Winter Holiday Party on Wednesday, December 13th, 2005. Many familiar faces took time out of busy schedules to come and visit with students, staff and faculty. Social committee: Jeanette La Grange, Edith Landing, Sherri Martinez, Sharon Shepard, Marlene Tjernagel and co-chairs, Norma Elwick and Denise Riker.
Future Alums

Owen William Edward Nettleton, was born December 17, 2005 to Dan Nettleton (Assistant Professor) and his wife, Karen. Owen weighed 7 pounds and 9 ounces and was 20.25 inches long. Owen gave dad about 14 hours to finish grading his final exam before entering the world! Brother Sam (8) and sister Kate (5) were delighted with the newest member of the Nettleton family.

Jamie Lynn Froelich was born December 21, 2005 to Amy Froelich (Assistant Professor) and her husband Jim. Jamie was 20 inches long and weighted 10 pounds. Big sister Sarah Angela was thrilled with the new addition to the family.

Lily Rose Larsen was born April 11, 2006 to Mike Larsen (Assistant Professor) and his wife Alice. Lilly weighed 9 pounds 6 ounces and measured 21 inches in length. Faculty members Taps Maiti and Amy Froelich covered classes for Mike while he attended to his wife and daughter.

H.A. David Seminar & Commencement of the Herbert A. David Distinguished Lecture


Ken Koehler, Department Chair, announced after the seminar the commencement of the Herbert A. David Distinguished Lecture to be given in Professor David’s honor. The first distinguished speaker would be Professor Laurens de Haan, Erasmus University, Rotterdam, Netherlands in April 2006.
The annual Spring Breakfast was scheduled to be held at Brookside Park on Saturday, April 29th, 2006. Because of the forecast of rain the day prior to the picnic a decision was made quickly to re-locate the picnic from outdoors to indoors in Snedecor Hall. Emails were quickly sent out, signs were put up at the park, tables were moved from third floor of Snedecor to the second floor, a long banquet table was set up in the front south hallway and electrical cords were distributed for the many griddles and skillets. On Saturday, the aroma of pancakes and French toast welcomed everyone in out of the rain. The menu consisted of Panera coffee cakes, made-to-order-omelets, French toast and pancakes with Vermont syrup, hash brown potatoes, and for the vegetarians, tofu scramble, orange juice and coffee. It rained all of Friday night and most of Saturday, so the decision to move the picnic indoors was a good one.
On Friday, August 18th, 2006, Professors Dean Isaacson and Alicia Carriquiry (Co-DOGEs) welcomed 33 new MS and PhD graduate students to the Statistics Department. Of the 33 new graduate students, 22 students plan to pursue a PhD in statistics. Four of the 22 PhD students are RTG fellows, five are AGEP fellows, one is an IGERT fellow and one is a VIGRE fellow.

**STATers 2006**

Faculty Advisor: Daniel Nordman, Elizabeth Berg, Maria Joseph, Jonathan Hobbs, Kyle Hewitt and Nick Beyler

**STATers Officers:**

Kyle Hewitt ...................................................................................................................... President
Maria Joseph ............................................................................................................ Vice President
Jon Hobbs ....................................................................................................................... Treasurer
Emily Berg ....................................................................................................................... Secretary
Nick Beyler ................................................................................................................. Social Chair

**STATers Committees:**

Amanda Bell & Lucas Beverlin........................................................................ First Year Representatives
Jessica Chapman......................................................................................... Birthday Coordinators
Amanda Bell, Erica Dawson, Rachel Graham, Steven Lund, Stephanie Platt, Brian Wegner Community Service Coordinator
Si Yaquing, Liu Zhe....................................................................................... International Committee Chair
Tim Bancroft ............................................................................................. Intramural Coordinator
Will Baumann, Ivan Ramler ........................................................................ Recycling Coordinator
Nick Beyler (chair), Tim Bancroft, Melissa Bingham, Kari Kraemer Student Services
Mike Claveria ................................................................................ Student Representative to the Faculty
Maria Joseph (chair), Bridget Lavelle Student Seminars
Hadley Wickham ....................................................................................... Webmaster
Dan Nettleton ................................................................................................ Co-Faculty Advisors
**Fall Picnic 2006**

The 2006 Fall statistics picnic was well attended with 96 people signed up, including six children, two babies, and two dogs. The weather felt like fall not summer. Heike Hofmann brought a wooden Swedish game called Kubb. The games object is to be first team to knock over your opponent’s kubbs and the king using a wooden baton. The graduate students also enjoyed a game of frisbee golf. There was a lively card game of BS with Dr. Dixon and several grad students going on in the shelter house.

**Joint Statistical Meetings (JSM) – 2005**

There were approximately 15 faculty and 38 graduate students from the department that attended the JSM Conference in Minneapolis August 7-11, 2005 at the Minneapolis Convention Center. The Department hosted an alumni family picnic on Saturday afternoon, August 6th at French Regional Park on Medicine Lake. The reception/bar-b-que was planned and co-hosted by the department and Fred Hulting, a former alumnus. The bar-b-que was catered by a local vender and was attended by faculty, students, alumni and friends that attended the convention.

### JSM Participants

Alicia Carriquiry  
Arindam Chatterjee  
Lihua Chen  
Song Chen  
Dianne Cook  
Philip Dixon  
Karim Dorman  
Bill Duckworth  
Fang Fang  
Amy Froelich  
Wayne Fuller  
Chunwang Gao  
Arka Ghosh  
Heike Hofmann  
Dean Isaacson  
Qi Jiang  
Mark Kaiser  
Ken Koehler  
Soumendra Lahiri  
Reid Landes  
Michael Larsen  
Jason Legg  
Xiaoxi Li  
Yan Li  
Juan Liu  
Tanzy Love

### JSM Attendees

Xueyuan Cao  
Rhonda DeCook  
Cumhur Yusuf Demirkale  
Kun Liang  
Curtis Miller  
Massiel Orellana  
Yingli Qin  
Justin Recknor  
Dong Wang  
Yaqin Wang  
Han Wu  
Qun Xiang  
Wuyan Zhang  
Zhigang Zhou
**Joint Statistical Meetings (JSM) – 2006**

<table>
<thead>
<tr>
<th>JSM Participants</th>
<th>JSM Attendees:</th>
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<tbody>
<tr>
<td>Will Baumann</td>
<td>Ted Bailey</td>
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<tr>
<td>Shu-Ann Fang</td>
<td>Alicia Carriquiry</td>
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<td>Chunwang Gao</td>
<td>Song Chen</td>
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<td>Rachel Graham</td>
<td>Dianne Cook</td>
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<td>Jon Hobbs</td>
<td>Philip Dixon</td>
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<td>Yili Hong</td>
<td>Karin Dorman</td>
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<td>Ling Huang</td>
<td>Amy Froelich</td>
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<td>Qi Jiang</td>
<td>Wayne Fuller</td>
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<tr>
<td>Courtney Kies-Bokenkroger</td>
<td>Ulrike Genschel</td>
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<td>Jason Legg</td>
<td>Kyle Hewitt</td>
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<tr>
<td>Wen Li</td>
<td>Heike Hofmann</td>
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<tr>
<td>Xiaoxi Li</td>
<td>Karen Kafadar</td>
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<tr>
<td>Lu Lu</td>
<td>Mark Kaiser</td>
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<tr>
<td>Zheng Lu</td>
<td>Ken Koehler</td>
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<tr>
<td>Pushpal Mukhopadhyay</td>
<td>Soumendra Lahiri</td>
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<td>Min Hui Paik</td>
<td>Mike Larsen</td>
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<td>Yingli Qin</td>
<td>Kun Liang</td>
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<td>Chengyong Tang</td>
<td>Fred Lorenz</td>
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<tr>
<td>Dong Wang</td>
<td>Taps Maiti</td>
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<tr>
<td>Jianqiang Wang</td>
<td>Ranjan Maitra</td>
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<tr>
<td>Yaqin Wang</td>
<td>Mervyn Marasinghe</td>
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<tr>
<td>Hadley Wickham</td>
<td>Bill Meeker</td>
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<tr>
<td>Yu Wu</td>
<td>Dan Nordman</td>
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<tr>
<td>Shu Zhang</td>
<td>Sarah Nusser</td>
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<tr>
<td>Yi Zhang</td>
<td>Jean Opsomer</td>
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<tr>
<td>Yan Zheng</td>
<td>Stephanie Platt</td>
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**Retirements**

WILLIAM J. KENNEDY, JR. (Professor) taught for the Statistics Department for 41 years. Bill came to ISU in 1965 from Oklahoma State with his MS in order to go through the PhD program and work as an instructor. In 1969, when he received his PhD he was appointed an Assistant Professor, in 1973 he was appointed an Associate Professor, and in 1978 Bill became a full professor.

Bill had the privilege of being one of Ted Bancroft’s last students. Bill is one of the pioneers in statistical computing. The book, *Statistical Computing*, that he co-authored with Jim Gentle in 1980 helped to define the field. Bill served as editor of both *The American Statistician* and the *Journal of Computational and Graphical Statistics*. He directed 12 PhD students and 25 MS students in statistics at ISU.

Bill retired June 30, 2005, however he will remain in Snedecor Hall and do research. The Department had a small “Gone Fishing” party to congratulate him and wish him the best.

HERB WILSON, a USDA collaborator on the long-standing National Resources Inventory (NRI) cooperative agreement between USDA and the Center for Survey Statistics and Methodology (CSSM), retired January 3, 2006. A devoted Hawkeye football fan, Herb's professional life started and concluded at ISU. Herb earned his B.S. degree in Agronomy at ISU and was hired by ISU as a cooperating soil scientist. He then began a 32-year career as a soil scientist with the Natural Resources Conservation Service (formerly the Soil

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Conservation Service). Herb mapped soils, served as a wetlands specialist with EPA, led Iowa's soils digitizing project, collected NRI data for Iowa, and since 1996 has advanced the national NRI program while collaborating with colleagues in CSSM. Herb's major NRI accomplishments are noteworthy, including updating and maintaining the national soils database underpinning the NRI. Herb's enduring contribution is his example of unselfish and unfailingly patient delivery of friendly and insightful help to hundreds of NRI data collectors in the United States and territories. He counted as friends all who sought his experience and expertise. To those hundreds and more – and to all of his colleagues in Snedecor Hall – Herb is the friendly face and voice of the NRI. In January 2006, colleagues and friends from ISU and NRCS celebrated Herb's retirement with a luncheon, gifts and good wishes. Herb now devotes his time to golf, fishing, the Hawkeyes, and his family. We will miss Herb and his contributions to the NRI cooperative agreement.

**Resignations**


Liang Peng (1/2006-5/2006) Assistant Professor, Georgia Institute of Technology.

**In Memoriam**

FLORENCE JEBE. We are sad to report that Florence Jebe died in November 2005. Florence and Emil Jebe were good friends and generous supporters of our program. Emil Jebe died in 1996. He had BS and MS degrees in Economics from Iowa State and a PhD in Statistics from North Carolina State. Emil was an Associate Professor in our department from 1949-1959. Emil and Florence visited Iowa State on several occasions. Florence wrote a book, ‘The Bonus Years’ that she donated to the department Reading Room. She and Emil both lived rich and productive lives.

ED SCHILLMOELLER. ISU and the Department of Statistics received the sad news that Ed Schillmoeller passed away on November 13th, 2006. Ed, his daughter Laura and son Michael were all alumni of this Department. Ed received a BS degree in 1953 with a major in mathematics and a minor in statistics. His extracurricular activities included three years on the Iowa State Football team. After graduation Ed was commissioned as a second lieutenant in the Air Force and was discharged as a First Lieutenant in 1955. He went to work as a statistician for A.C. Nielsen and had a very successful career. His career as a statistician must have looked good to his children, since two of them studied statistics at Iowa State. His son, Michael, earned a BS in statistics in 1979 and his daughter, Laura, completed her MS in statistics in 1992. These connections led to the establishment of the Schillmoeller Family Scholarship in Statistics. This endowment provides a scholarship for an undergraduate majoring in statistics. Many students have benefited from this scholarship. The Schillmoeller family has continued to support both the Department of Statistics and the Athletic Department. Their support has made both departments better. Successful graduates like Ed are the best measure of our accomplishments as a department. We will miss him.
HONORS & AWARDS

Achievements & Recognitions

ASA Elected Fellow Member 2005 ............................... Diane H. Cook, Jean Opsomer
ASA Elected Vice President .................................................... Alicia Carriquiry
ASA/JSJ Student Winning Paper ....................................... Pushpal Mukhopadhyay
ASQ (American Society for Quality) Elected Fellow 2006 ................... William Meeker
Data Exposition Contest, ASA, Second Prize 2006 .................... Heike Hofmann
Drafting Expert in FAO-WHO Workshop on Nutritional Risk 2005
Geneva, Switzerland, Invited Participant .................................... Alicia Carriquiry
IMS Elected Fellow Member 2006 ...................................... Alicia Carriquiry
Information Visualization Contest 2005, First Prize ..................... Heike Hofmann
Info Vis Challenge 2005, “Boom and Bust of Technology
Companies at the turn of the 21st Century”,
Second Prize ........................  Dianne Cook C. Rottger, H. Hofmann J. Sun, H. Wickham,
ISI Elected Fellow Member 2005 ........................................ Soumendra Lahiri, Jean Opsomer
ISU 25-Year Club Members 2006 .................................. Krishna Athreya and Mervyn Marasinghe
Order of the Knoll Member 2006, ISU ........................................... Mack Shelley
Statistics Applied to Agriculture Conference 2005,
Keynote Speaker ................................................................. Alicia Carriquiry
Synar Survey Estimation System Technical Assistance
Multi-state Workshop 2005, Invited Participant,
US Department of Health & Human Services,
Center for Substance Abuse Prevention .................................... Mack Shelley
van Eeden Distinguished Lectures 2006,
University of British Columbia ............................................... Jean Opsomer
Vrije Universiteit in Amsterdam 2006, Visiting Professor ............... Carl Roberts

Promotions

University Professor ........................................... Mack Shelley (2006), Steve Vardeman (2005)
Associate Professor .................................................. Dean Adams (2006)
Department of Psychology Chair ........................................ Doug Bonett

International/National Honors and Awards

American Society for Quality Shewhart Medal 2006 .................. William Meeker
American Statistical Association Outstanding
Contributed Paper Award 2005,
Physical and Engineering Sciences Section ................................. William Meeker
‘Betty Harrah Manuscript of the Year’ Award 2005, Journal of College and University Student Housing, Co-Winner, “The Influence of Residence Hall Community on Academic Success of Male and Female Undergraduate Students” ................................. Mack Shelley

Honorable Mention Outstanding Presentation Award 2005, ASA, Section on Physical and Engineering Sciences ........................................... Ulrike Genschel

Statistician of the Year 2006, ASA, Chicago Chapter ............................... William Meeker

**University Awards**

Early Achievement in Research Award 2006, LAS .................................. Heike Hofmann

Martin F. Fritz Research Productivity Excellence Award 2005 .................... Doug Bonett

Master Teacher Award 2005, LAS .................................................... Philip Dixon & Doug Bonett

Merit Excellence Award 2006 .................................................................. Jeanette La Grange

Outstanding Teaching Award, LAS ........................................................ Stephen B. Vardeman

Regents Award for Faculty Excellence 2005 .......................................... Derrick K. Rollins, Sr.

Regents Award for Staff Excellence 2006 .............................................. Dianne Anderson

University Professor Award 2005 ........................................................... Stephen B. Vardeman

Scientific & Technological Achievement Award 2005, National Center for Environmental Research, Level III ......................... Petruta C. Caragea
Graduate Awards & Scholarships

Bancroft Award
Chengyan Yue

Dan Mowrey Consulting Excellence Award
Hadley Wickham

Eli Lilly Fellowship
Emily Berg
Nichola Beyler
Anna Ericksen
Volodymyr Melnykov
Yaqin Wang
Xia Xu

George W. Snedecor Award in Statistics
Arindam Chatterjee

GlaxoSmithKline Industrial Scholarship
Soutir Bandyopadhyay

Holly C. & E. Beth Fryer Award in Statistics
Arindam Chatterjee

Oscar Kempthorne Award
Jeremy Craft

Richard Kleber Award
Anna Ericksen

Teaching Excellence Award
Tim Bancroft
Rachel Graham
Xiaohong Zhang

Vera David Graduate Fellowship in Statistics Award
Melissa Bingham
Kim Mueller

Vince Sposito Statistical Computing Excellence Award
Ivan Ramler
Undergraduate Scholarships & Awards

George W. Snedecor Undergraduate Statistics Award
Kimberley Minnis

Herta & H.T. David Scholarship
Hang Li

Procter and Gamble Company Undergraduate Statistics Scholarship
Kimberly Minnis

Schillmoeller Family Scholarship in Statistics
Angela Meisterling
Christopher Ryan
Phillip Sherman

Statistics Undergraduate Scholarship
Christopher Kielion
The Graduate Program continued its growth and development in 2005-06 with significant help from the VIGRE (Vertical Integration of Graduate Research and Education) Grant. Twenty-five new students were introduced at the opening seminar in August 2005. Nineteen of these were given graduate assistantships with 10 of the 19 receiving support from the VIGRE grant. Nineteen of the 26 new students applied to the PhD program so our fraction of PhD students continues to rise. This rise in PhD students was also evident in the number of students taking the PhD written exam in July of 2005. Eleven students took the regular exam and two took the co-major exam.

The successful recruitment of excellent graduate students continued in the next year. At the 2006 opening seminar 36 new students were introduced. Twenty-eight of these students were given an assistantship/fellowship. For this year we had the VIGRE grant and a new NSF grant called the RTG (Research Training Grant). The RTG supports PhD students who have interest in the application of statistics to problems in the physical and engineering sciences. Eleven students had some NSF support. Twenty seven of the 36 students applied to the PhD program. This growth in PhD students was again seen in the number taking the PhD written exam in July of 2006. Thirteen students took the regular PhD exam and two took the co-major exam. All 15 students were taking this exam for the first time.

With so many students pursuing a PhD degree, the Department turned its attention to retention. In the summer of 2005, a one credit summer course was introduced to prepare the PhD students for Stat 642. The summer course introduced students to the vocabulary and main ideas from Measure Theory so that the transition into Stat 642 would be smoother. In the fall of 2006, one teaching assistant position was given to an advanced PhD student who was assigned to assist all first year students in the core courses. This student held problem sessions and extra office hours for the first year students. These two changes have helped students through the challenging core courses.

**The AGEP & Alliance Programs**

Another significant change that started in 2005 is the increase in the number of students from under-represented groups. The Department has actively participated in both the AGEP (Alliance for Graduate Education and the Professoriate) and the Alliance (Alliance for the Production of African American PhDs in the Mathematical Sciences) since 2002. Both of these NSF grants provide funding for summer internships for undergraduates. We had several students do research with our faculty each summer and we worked on recruiting these students into our PhD program. In the fall of 2005, one of the Alliance students entered our PhD program. She helped us recruit six more African American students and one Pacific
Islander for the fall of 2006. The Department is becoming much more diverse and this diversity is strengthening the program.

The National Science Foundation support through the VIGRE, RTG, AGEP and Alliance grants has made a significant difference. We look forward to continued growth even after these grants expire because these grants have changed the culture, curriculum and expectations within the department.

Working Groups

The working groups created by the VIGRE initiative have continued to develop. Faculty leaders of the working groups are as follows:

Bioinformatics and Genetic Statistics ............................................ Dan Nettleton, Karin Dorman
Ecological and Environmental Statistics ......................................... Philip Dixon, Mark Kaiser
Engineering Statistics ........................................................................................................ Max Morris
Graphical and Computational Statistics ........................................... Dianne Cook, Ranjan Maitra
Probability and Mathematical Statistics .......................... Soumendra N. Lahiri, Song Chen (Fall 2006)
Survey Statistics and Statistics in the Social Sciences ........... Michael Larsen, Fred Lorenz, Taps Maiti, Sarah Nusser

All of these groups met on a weekly or biweekly basis to discuss faculty and student research and explore new topics and initiatives. These groups also provide new graduate students with opportunities to become better acquainted with faculty and potential research opportunities.

Undergraduate Summer Research Experience

VIGRE Conference Day (July 28, 2005)

There were six visiting undergraduate researchers in the summer VIGRE program, plus one other visiting student (Aetekah Owais), that presented projects they had worked on during the 8-week program in June and July. The students worked on their projects for eight weeks and gave 20-25 minute presentations with a question/answer time for the professors and graduate students that attended the conference. There were three project presentations in the morning and three in the afternoon. Lunch was provided in the Howe Hall atrium. Graduate student mentors Will Baumann and Rhonda DeCook coordinated the program again this year under the direction of Dean Isaacson, Alicia Carriquiry (Co-DOGEs) and Mark Kaiser.

The student, title of their paper and their faculty mentor for the summer of 2005 were:


**Mike Claveria**, “*The rise and fall of high tech industry.*” Heike Hofmann.

**Katie Elsbernd**, “*Predicting improvement in science scores under an active learning approach to teaching science.*” Mack Shelley.

**Amy Hoeksema** and **Matt Timm**, “*Finding a suitable estimator for the discarded weight on individual trips in marine fisheries.*” Mark Kaiser.

**Chris Martinek**, “*The effects of family economic hardship on the personal confidence of rural wives and husbands.*” Mike Larsen and Fred Lorenz.

**Aatekah Owais**, “*Statistical analysis with missing data.*” Mike Larsen and Fred Lorenz.
Alliance Conference Day (July 29, 2005)

Emmanuel Criner, “Dynamic modeling of insulin and glucose levels with the use of
descrete-time state spaced modeling.” Derrick Rollins.

Dana Hill-House, “Absorption times and probability of Markov Chain analysis.” Andrew
Halvorsen (graduate student mentor) and Dean Isaacson.

Maria Joseph, “A multivariate statistical anlysis of nutrient intake data for WIC
participants.” Gabriel Camano-Garcia, Tanzy Love, Rhonda DeCook (graduate
student mentors) and Alicia Carriquiry.

Nicole Rembert, “Markov chains.” Andrew Halvorsen (graduate student mentor) and
Dean Isaacson.

Alliance Conference Day (July 25-26, 2006)

The Alliance summer program for 2006 was held in June and July. Melissa Bingham,
Jeremy Craft, Kyle Hewitt, Jon Hobbs and Maria Joseph coordinated the program
under the direction of Dean Isaacson and Alicia Carriquiry.

The student, title of their paper and their faculty mentor for the summer of 2006 were:

Angelitta Britt, “Framing Dynamic Modeling of Type 2 Diabetes.” Derrick Rollins.

Nathaniel Clay, “Are Young Adult Children a Source of Support for Midlife Parents?”
Fred Lorenz.

Dominique Morgan, “Avian Pneumovirus Serology: Verification of Results Among
Testing Laboratories at Iowa State University, University of Minnesota, and Willmar,
Minnesota.” Jonathan Hobbs (graduate student mentor) and Ken Koehler.

Kylah Porter, “Effect of Learning Communities at Iowa State University.” Mack Shelley.

RTG

The Research Training Group (RTG) in Statistics for the Engineering and Physical Sciences is
now in its second year. The Group, funded through a grant from the National Science
Foundation is composed of ten faculty (Alicia Carriquiry, Song Chen, Arka Ghosh, Heike
Hofmann, Ranjan Maitra, Bill Meeker, Max Morris, Derrick Rollins, Steve Vardeman and
Huaiqing Wu) and ten graduate students at various stages in their studies. The students
currently in the program (in alphabetical order) are: Will Baumann, Amanda Bell, Lucas
Beverlin, Melissa Bingham, Jessica Chapman, Mike Claveria (left fall 2006), Jeremy Craft, Jon
Hobbs, Wendy Kisch, Steve Lund, Kim Mueller, Garritt Page, Adam Pintar, Justein Reiners
and Nicole Rembert.

A cornerstone of the RTG project is an experiential research component. Thanks to the
funding we received from NSF, students in the program who are beginning to think about
their research can spend significant amounts of time at a partner organization working side-
by-side with scientists and “problem owners”. The idea is that the student, with mentoring
from a scientist at the partner organization and from her/his advisor in the Department will
identify a challenging statistical problem rooted in a real-world complex problem that can
serve as the basis for the student’s dissertation. Jessica Chapman and Jeremy Craft visited Los
Alamos National Laboratory in summer of 2006 and plan on returning for a longer visit next
year. Adam Pintar is also planning a visit to LANL in 2007 after two major milestones
(written prelims and a wedding!). Jon Hobbs will be spending some time at the National
Center for Atmospheric Research next summer.

Faculty and students from the Group (as well as other faculty, staff and students) established
a workgroup to address the Netflix Challenge in Fall of 2006. Netflix (the largest by-mail
movie rental company) offered a $1,000,000 prize to any team who could improve the way
they make movie recommendations to their customers. To make this possible, Netflix released a massive dataset with approximately 100 million records consisting of a movie id, a customer id and the rating that the customer gave the movie. While playing this game, we have all learned quite a bit about organizing, exploring, summarizing and analyzing a massive dataset.

We look forward to another productive year and to our continued collaboration with partners both in and off campus.
The undergraduate program continued to attract good students with 36 undergraduate majors in fall 2005, 36 in spring 2006 and 37 in fall 2006. Twelve undergraduate majors made Dean's List (GPA of 3.5 or above for 12 or more credits) in fall 2005, twelve in spring 2006 and eleven in fall 2006. Hang Li and Kimberly Minnis were elected to the Phi Beta Kappa Honor Society. Kimberly Minnis received the Edward Allen award for being the top student in the mathematical disciplines elected to Phi Beta Kappa. Kimberly Minnis also was awarded the George W. Snedecor Undergraduate Statistics Award as the top student in the undergraduate program in statistics. Six students graduated between fall 2005 and fall 2006 with undergraduate degrees in statistics.

**Conceptual Statistics**

Professors Amy Froelich, Bob Stephenson and Bill Duckworth concluded their work on developing course activities as a part of their National Science Foundation (NSF) grant. Results of the assessment from the project were presented at the Joint Statistical Meetings 2005 in Minneapolis for the 2003-2004 school year and at the Joint Statistical Meetings 2006 in Seattle for the 2004-2005 school year.

**Graduates and First Activity:**

- Abbey, James (I 2005)
- Choi, Hyun “Ken” (F 2006)
- Hung, Ling Yeung (F 2006), Returned to Hong Kong.
- Howard, Reka (S 2006, other major Mathematics), Graduate School in Statistics, Iowa State University, Ames, IA
- Knoke, Katherine (Junge) (F 2006)
- Li, Hang (SS 2006)
- Merrick, Courtney (S 2006), Actuarial Reporting Specialist, AmeriUS Group, Des Moines, IA
- Min, Jun Young (I 2005)
STATISTICAL COMPUTING

Statistical computing support in the department is overseen by the Departmental Computing Advisory Committee, which was chaired by Dianne Cook and Mervyn Marasinghe in 2005-2006. The committee compiled a Departmental Computing Policy which is available to departmental members on the intranet site.

Computing support is provided by Ted Peterson and Kathy Shelley, who supervised graduate research assistants. These included Ying Shi, John Riddles, Hadley Wickham, Yaqin Wang, and Kavitha Balasubramanian in 2005-2006. An undergraduate student, Brett Hagenman, was also employed for the Fall 2005 semester.

The responsibility of the support staff is to provide computing support for the day to day operation of the department, so that office management runs smoothly, and to support the research and teaching activities of the faculty and graduate students. This includes hardware purchase and maintenance, statistical software installation, maintaining the departmental computing labs and the web site, developing and delivering instruction on computer use and consulting on an irregular basis.

Research

Faculty in the department have personal computers, primarily laptops and many also have desktops in their offices. These are backed up on Department file servers on a regular basis.

Computing needs for research has been enhanced by a Mac cluster, purchased with NSF funding, and installed summer 2005. Faculty and graduate students use the cluster for computing jobs that require more power than a single desktop or laptop. The Mac cluster also provides 8Tb of disk space for storing departmental backups and student files. At the end of 2006, the department ordered 3 Linux computers, each with 4 processors and one with 16GB of memory. These machines, jointly funded by the department and LAS Computation Advisory Committee student computer fee funds, are for the purposes of graduate student research and coursework.

Teaching

The department maintains two teaching labs, Snedecor 321, 322, a JMP help room in Snedecor 307, and a graduate student computing lab in Snedecor 203. In addition, desktops are provided in most graduate student offices. The department also made several laptops available for check out for teaching purposes from the computing support staff. LASCAC student funding was received for software licenses and operating expenses for these teaching labs.

Distance education efforts were expanded, primarily by having instructors record and deliver their own lectures instead of using the University’s services. Kathy Shelley has led the effort to use tablet PCs with the software Camtasia to do this.

A new system for storing, delivering and archiving course material was developed by Ted Peterson. This provides a complementary electronic material delivery system to University-wide WebCT system. Kathy Shelley has developed knowledge of WebCT and can help instructors get started with this system.

Service

Web page development has become more automated with online databases and php coding to drive the content and display of the pages. Hadley Wickham and John Riddles, two department research assistants, have been instrumental in converting the seminar, directory, publication, and course web pages to this system. The databases underlying this system are
maintained by departmental support staff. Day to day web site maintenance is provided by the computer support staff and by Sherri Martinez. Sherri is also responsible for maintaining the Stat Times and Alumni web pages. Content for the departmental directory for faculty is driven by the faculty data base, set up by Ted Peterson, to maintain current information on each faculty member’s research and teaching activities. The web server is maintained by IT services, which is our own dedicated server.

University-wide assistance is provided for statistical software installation and general consulting for this software. The Statistics Department Computer Support group is the only one on campus that has devoted time and resources to organize and distribute student copies of Windows SAS as per SAS’ license agreement. This enables students taking graduate courses to use SAS locally on their personal computers. SPSS and SAS usage questions are also fielded by this group.

Ted Peterson participated in the departmental committee to provide input to the architects planning the Snedecor Hall renovations.

**Future Plans**

Several new directions are planned:

- Purchase a new mass storage system that will enable office staff to coordinate activities, and streamline computer backups.
- Use clickers in the classrooms for immediate feedback.
- Improve computing conditions for graduate students in the new building.
CENTER FOR SURVEY STATISTICS AND METHODOLOGY (CSSM)

CSSM, under the direction of Dr. Jean D. Opsomer, continues to provide a wide variety of research services, providing consultation and direct operational assistance to researchers in sample design and the planning and execution of sample surveys and censuses. Center faculty and staff also conduct research and teach courses in the areas of sampling, survey design, and statistical methods. CSSM’s National Resource Inventory Group, under the leadership of Dr. Sarah M. Nusser, conducts research on land-use in the United States and its territories in collaboration with staff from the Natural Resource Conservation Service (NRCS) as part of a cooperative agreement with USDA. The Survey Research Services Group collaborates with researchers from ISU and other institutions on a wide variety of topics including studies on agriculture, medicine, education, political science and business, as well as surveys and evaluations for ISU administrators and non-research entities.

National Resources Inventory (NRI)

This past year was a busy and productive one for the NRI faculty and staff. The 2005 NRI survey data collections software was delivered to the Natural Resource Conservation Service. CSSM staff helped develop and present training materials for that survey. The NRI data collection system and infrastructure were extensively revamped to support digital collection for 2005. A calibration study was designed and implemented to guarantee consistency of the longitudinal data with these new digital data collection techniques.

Additional NRI work included revising software to allow collection of field data for rangelands in the western US. A handheld device uses the software to collect information on plant ecosystem characteristics.

Survey research for the year included new methods for quality control and outlier detection using clustering, fractional imputation and variance estimation, variance estimation of imputed data, and two-phase estimation and variance procedures. Research was initiated on imputation procedures for producing full NRI datasets. Work on rejective sampling was initiated. Robust measurement error model estimation is being studied in the context of the previously mentioned calibration study.

Survey Research Services (SRS)

This year, the SRS group collaborated with researchers on studies of business, agriculture, education, and health. They collaborated on several administrative projects as well. Staff developed survey instruments for computer-assisted telephone interviews and computer-assisted-self administered interviews, and for mail and on-line surveys. Additionally, they conducted data collection activities for telephone and mail surveys, and prepared final data files and methods and analysis reports for these research efforts.

Several studies relating to business were conducted including The Investment Decision-Making Survey. This study was conducted with a national sample of high-income households to learn how men and women differ, if at all, in their decisions about finances and investments. Staff collaborated on both survey and sample design, and SRS staff conducted 1000 telephone interviews. Researchers plan to use the data as a basis for developing improved financial education materials. The Iowa Manufacturing Survey was another business related survey and was conducted for the Center for Industrial Research and Service (CIRAS) at ISU. This mixed-mode survey collected information from Iowa Manufacturing companies using both on-line and mail protocols. The goal of the study was to analyze the state of manufacturing in Iowa and identify needs that CIRAS could address as part of its outreach mission. Following
completion of that study, staff began development work for an upcoming 2007 Family Owned Business Survey with colleagues from the University of Minnesota, the University of Montana, and The Ohio State University. This will be the third wave of data collection with this research group.

A number of projects focusing on agricultural topics were also conducted. The study A Survey of Farming Practices and Cover Crop Use included a mail survey sent to a sample of Midwestern farmers to assess barriers to use of cover crops as a sustainable farming practice. The Iowa Beef Center Evaluation Project consisted of telephone interviews with Iowa beef producers who participated in Iowa Beef Center Educational workshops and seminars as part of the Center’s self-evaluation. A Study of Decision Making in Uncertain Circumstances: Alaskan Halibut Fisherman implemented PDA data collection technology and surveyed Alaskan fisherman during multiple fishing trips. SRS staff programmed survey instruments, developed training materials, and coordinated PDA data transfers from the field to the home research sight. SRS also collaborated with a national panel of researchers on the Premium Standard Farms Community Surveys. Baseline data was collected from northern Missouri residents regarding their exposure to air pollution from a nearby hog production facility. These telephone interviews were followed by a number of diary reports of odor problems during peak pollution exposure times.

Other studies for the year included the continuation of the RDD control selection for the University of Maryland’s study of the Onset of Stroke in Young Men, continuation of the sample design and data processing activities for the Iowa Department of Education’s research work in assessing success of Iowa high school graduates, A Survey of Higher Education Challenge Grant Recipients, and administrative surveys for the “Iowa State Daily” newspaper, the Board of Regents (Faculty Activity Survey), and the ISU provost’s office (Faculty Exit Survey).
THESIS ABSTRACTS (PH.D.)

**Botts, Carsten**

BAYESIAN METHODS IN SINGLE AND MULTIPLE CURVE FITTING (2005)

This dissertation, composed of three papers to be submitted for publication in scholarly journals, focuses on Bayesian methods in function estimation. Chapter Two specifically discusses spectral density estimation. The semiparametric estimator derived in this chapter combines a smoothed version of the periodogram with a parametric estimator of the spectral density. This semiparametric estimator, which shrinks towards the parametric form provided it is correct, is derived from a hierarchical model. This estimator is consistent, it is competitive with other estimators (as seen through simulation studies), and ultimately does not require the specification or a parametric form.

The third and fourth chapters begin by modeling longitudinal data with linear mixed regression splines. The knots associated with the fixed and random effect curves (in the mixed model) are identified using Bayesian methods. In Chapter 3, reversible jump MCMC methods are used to sample from the marginal posterior of the knots associated with these two curves. Sampling from such a posterior, however, requires evaluation of the marginal likelihood of the knots. This marginal likelihood can not be calculated. Two sampling methods are thus considered in this chapter; these two methods correspond to two different approximations of this likelihood and are compared on how effectively they penalize models with unnecessarily large values of random effect knots.

In the fourth chapter, a similar posterior is considered. This posterior, however, relies on the decomposition of the random effect curve into orthogonal principal component curves, and restricts the random effect curves to have the same knots as the fixed effect curve. The knots associated with the fixed and random effect curves and the number of significant principal component curves is identified by sampling from their joint posterior distribution of knots.

**Camano-Garcia, Gabriel**

STATISTICS ON STIEFEL MANIFOLDS (2006)

When the orientation of an object lies in a space of non-zero curvature usual distributions of probability cannot be used to describe its directions. One of such spaces is the Stiefel manifold. We focus on a probability distribution defined on that space, the matrix Langevin distribution. Classical and Bayesian methods of estimation of the parameter of the distribution are discussed. As the dimension of the Stiefel manifold increases, the more complicated the estimation process becomes given the complexity of the functions to be evaluated. A method is given that efficiently parameterizes the elements of the singular value decomposition of the parameter of the matrix Langevin distribution in terms of generalized Euler angles. How to implement that parameterization in the context of Bayesian estimation is shown. The methodology is illustrated with a dataset on trace element concentrations in bullet tips from the Federal Bureau of Investigations.

**Chen, Lihua**

COMBINING GENERALIZED LINEAR MODELS (2005)

Traditional data analysis techniques that depend on the selection of a model are vulnerable to model uncertainty. This thesis establishes some statistical properties of an alternative to model selection, a model combining method called Adaptive Regression by Mixing (ARM). This work implements and extensively studies ARM in the context of generalized linear models including ANOVA, loglinear and survival models. We have found applications for the general idea of model combining in each of the three settings, and have derived the theoretical risk bound of the combined estimator in each.
In addition to demonstrating good theoretical properties and the empirical advantage of ARM in applications in all three settings, we have addressed specific issues and challenges posed by each setting. In combining loglinear models, we demonstrate how to apply ARM in a capture-recapture study and propose an approach to selecting a model list for combining given a high dimensional contingency table. In survival analysis, we empirically study combining different model classes. We also explore several measures to assess the predictive performance of a survival model. In the ANOVA setting, we propose model instability measures as a guide to the appropriateness of model combining in applications. We further systematically investigate the relationship between ARM performance and the underlying model structure. We propose an approach to assessing the importance of factors based on the combined estimates.

Finally, to address general computational issues, we have empirically explored the permutation times needed to produce stabilized weights for models and the relationship between ARM risk and the proportions used in the data splitting step of the algorithm. The results are largely consistent with our theoretical expectations.

DeCook, Rhonda

NEW STATISTICAL METHODS IN BIOINFORMATICS: FOR THE ANALYSIS OF QUANTITATIVE TRAIT LOCI (QTL), MICROARRAYS, AND EQTLS (2006)

This thesis focuses on new statistical methods in the area of bioinformatics which uses computers and statistics to solve biological problems. The first study discusses a method for detecting a quantitative trait locus (QTL) when the trait of interest has a zero-inflated Poisson (ZIP) distribution. Though existing methods based on normality may be reasonably applied to some ZIP distributions, the characteristics of other ZIP distributions make such an application inappropriate. In this study, we propose a QTL detection method, appropriate for any ZIP trait, that utilizes the EM algorithm to compute maximum likelihood estimates for the ZIP parameters. We compare our method to an existing non-parametric approach using simulation. The method is illustrated using QTL data collected on two ecotypes of the Arabidopsis thaliana plant where the trait of interest is shoot count.

The second study discusses a method to detect differentially expressed genes in an unreplicated multiple-treatment microarray time course experiment. In a two-sample setting, differential expression is well defined as non-equal means, but in the present setting, there are numerous expression patterns that may qualify as differential expression. By defining differential expression as any pattern other than a concurrent flat line over time for all treatment groups, we propose a method that allows the researcher to test the null hypothesis of no differential expression at every gene. This method provides the researcher with a list of significant genes, an associated false discovery rate for that list, and a ‘best model’ choice for every gene. The model choice component is relevant because the alternative hypothesis of differential expression does not dictate one specific alternative expression pattern. In fact, in this type of experiment, there are many possible expression patterns of interest to the researcher. Using simulations, we provide information on the specificity and sensitivity of detection under a variety of true expression patterns using receiver operating characteristic curves. The method is illustrated using an Arabidopsis thaliana microarray experiment with five time points and three treatment groups.

The third study discusses a new type of analysis, called eQTL analysis. This analysis brings together the methods of microarray and QTL analyses in order to detect locations on the genome that control gene expression. These controlling loci are called expression QTL, or eQTL. Locating eQTL can help researchers uncover complex networks in biological systems. For data sets containing thousands of genes and hundreds of markers, there are potentially millions of tests of interest. Besides the difficulty involved in sifting through millions of tests, the issues previously discussed in QTL analysis and microarray analysis are also present here. For each of these types of analysis, a different multiple-testing adjustment is utilized. The adjustment for a QTL analysis accounts for the strong correlation between tests at consecutive markers, while the adjustment for a microarray experiment accounts for the block-structure
correlation between gene expression values in an individual arising from gene coregulation and other gene-to-gene relationships. Both of these types of multiple testing must be considered when determining statistical significance of eQTLs. The method is illustrated using an *Arabidopsis thaliana* eQTL experiment with 22,787 genes and 288 markers.

**Esker, Paul**

EPIDEMIOLOGY AND MANAGEMENT OF STEWART'S DISEASE OF CORN IN IOWA (2005)

Research was conducted from 2001 to 2003 in Iowa to determine ideal sampling methods, as well as the effect of planting date with/without seed insecticides to reduce corn flea beetle vector (CFB) (*Chaetocnema pulicaria*) feeding and Stewart's disease (*Pantoea stewartii*) of corn. Sampling for CFB's was conducted at Ames, Crawfordsville, and Sutherland in 2001 and Crawfordsville and Johnston in 2002. Yellow sticky cards were placed at 15 combinations (five replications) of height (0.15, 0.3, 0.45, 0.6, 0.9 m) and orientation (vertically, horizontally, or 30º angles) at each location. The 0.3 m and vertically facing cards significantly captured more CFB's (1.1 to 35 times) during 2003. To study the effects of planting date with/without seed insecticides, trials were conducted at Crawfordsville (2002 and 2003). Ten (2002) and eight (2003) planting dates were established in multifactorial combinations with seed insecticide (nontreated, Poncho®, Cruiser®) in a randomized complete block design (four replications). Five (2002) and six (2003) planting dates were examined for incidence of CFB feeding scars and Stewart's disease. Analyses revealed a reduction in incidence of the early wilt phase with delayed plantings, however, increased numbers of CFB's and rates of Stewart's disease were observed for these delayed plantings. Yield was also significantly reduced in delayed plantings. Delayed planting as a viable management tactic for Stewart's disease was deemed unfeasible. Furthermore, we examined forecasting models for Stewart's disease. Our goal was to increase pre-plant prediction accuracy at the county-level. We used binary logistic regression for modeling. The Stevens and Stevens-Boewe models were found to greatly under predict Stewart's disease occurrence, while the Iowa State Model improved forecasting. Also, two-factor models using air temperature [Iowa State Model, frequency of days with minimum air temp • -6.7ºC, sum mean monthly temperatures (Dec., Jan., and Feb.)], plus previous history of Stewart's disease in a county increased accuracy to 75-80%. Using receiver operating characteristic curves and an economic cost function for false predictions (positive and negative), a probability of 40% was defined for forecasting Stewart's disease. Overall, this thesis provides relevant new information in order to improve forecasting and management of Stewart's disease in Iowa.

**Heilmann, Cory**

ESTIMATION OF GREENHOUSE GAS EMISSIONS FROM A TRACER GAS STUDY (2005)

This thesis models the emission of three greenhouse gases that exist in nature, CH₄, CO₂, and N₂O, from a hoop structure, using the artificial introduction of a tracer gas, SF₆, which exists in nature at levels below detection limit. Hoop structures are facilities used to house pigs before their slaughter. Many other studies of hoop structure emissions measure only one sample of the tracer gas and greenhouse gas at a time. However, the data sets in our study consist of 25 to 45 samples of each gas, taken on fixed grids of points. We will construct models to account for the relation between the greenhouse gases and SF₆ as well as spatial relations in the data set. We will use these models along with the known emission rate of SF₆ to estimate the relative rate of emission of the greenhouse gases.

We fit a Bayesian hierarchical model to the data sets. In this model, we relate the pointwise concentrations of one greenhouse gas and SF₆ and then analyze the posterior distribution of a parameter representing the relative rates of emission of the greenhouse gas and SF₆. We assume lognormal measurement errors of the greenhouse gas and SF₆ around the true concentration of each gas.

We also fit geostatistical models to estimate the rates of emission of these gases. We consider block kriging, block co-kriging, and lognormal block kriging to estimate the concentration of
each gas. An advantage of geostatistical models over the Bayesian hierarchical model is that we do not assume strict proportionality of the concentrations of the gases. These estimates can be related to the relative rate of emission of the gases. Due to the small size of these data sets, we take into consideration the uncertainty of the variogram parameters and how this uncertainty affects block kriging averages and variances.

We use simulations from both geostatistical models and Bayesian hierarchical models to determine superiority of one set of models in terms of coverage probabilities, bias, and length of coverage sets or confidence intervals. We also address the concern of spatial design for the geostatistical models.

Jiang, Qi
STATISTICAL ANALYSIS OF SAFETY AND HEALTH ISSUES (2006)
Statistical analysis is an essential tool in safety and health research. This thesis is composed of statistical analyses for three different types of safety and health projects: power-take-off entanglements, farm stress, and heart problems and diabetes, in addition the related statistical issues are discussed.

In the power-take-off entanglements project, an experimental design was used to study the risk of entanglement in power-take-off driveline. The response variable was a binary variable indicating whether a dangerous “entanglement” occurred or not. The experimental factors were angle of introduction, length of specimen, and type (stiffness) of material. The main conclusion was that the entanglement risks are higher when the angle of introduction is closer to perpendicular, or when the length of specimen is increased.

The farm stress study was based on a survey conducted among Iowa farmers. The purposes of the study were to determine the most stressful events/activities for farmers, demonstrate whether demographic groups affect stress levels, and to identify unnecessary survey questions. The response variables were stress levels on 62 events/activities. The main conclusion was that the respondents felt different level of stress dependent on age, gender, and so on; death of a spouse and the death of a child were found to be the most stressful events. Also, it was determined that some questions could be removed from the survey without significant loss of information.

The health problems and diabetes study used survey data collected by the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System (BRFSS). The interesting random variables were whether the interviewee had heart disease, or/and diabetes, and personal health status. The major purposes of the study were checking whether personal habits and background were associated with exposure to diabetes or/and heart disease, and whether a person's background was associated with personal health status. Main conclusions included a strong relationship between diabetes and heart disease and that personal background and habits, such as age, gender, diet habits, etc. are associated with the proportion of heart disease or/and diabetes. Also, personal health status is associated with age, gender and whether individuals live with partners or not.

Jovaag, Kari Ann
WEEDY SETARIA SPECIES-GROUP SEED HETEROBLASTY BLUEPRINTS SEEDLING RECRUITMENT (2006)
The relationship between weedy Setaria seed dormancy and subsequent behaviors in the soil culminating in seedling recruitment is elucidated. Weedy Setaria seed dormancy capacity heterogeneity (heteroblasty) at the time of dispersal was characterized for 45 locally adapted Setaria populations, as influenced by parental genotype (species, time of embryogenesis) and environment (year, location). Taken together, the 45 responses represented Setaria's “seed dormancy phenotype space”. The fate of heteroblastic seed entering the soil post-abscission was studied in four of the populations. When dispersed, heteroblastic Setaria seeds introduced into the soil form long-lived pools with varying cycles of dormancy, germination and death. The initially highly dormant seed after-ripenes with time and becomes highly
germinable, awaiting favorable temperature and moisture conditions: the heterogeneous germination candidate pool. As this pool is depleted in the spring and early summer by seedling emergence and death, dormancy is re-induced in the living seeds remaining in the soil. Seeds remain dormant throughout the summer, then resume after-ripening during late fall. This dormancy-germinability cycle exhibited complexity within and among the *Setaria* populations studied. Heteroblasty was retained within populations, and germinability responses to the yearly seasonal environment varied among populations. Seedling emergence behavior revealed the actual “hedge-bet” structure for *Setaria* seedling recruitment, its realized niche, an adaptation to the predictable mortality events caused by agricultural production practices. Complex oscillating patterns of seedling emergence were observed during the first half of the growing season in all 45 populations. These patterns were attributed to four distinct dormancy phenotype cohorts arising from inherent somatic polymorphism in seed dormancy states, and formalized using a mixture model consisting of four normal distributions. Variation in these patterns among *Setaria* populations revealed a fine scale adaptation to local conditions. The observed complexities in seedling recruitment behavior support the conjecture that the inherent dormancy capacity provides a ‘germinability memory’, the inherent starting condition that interacts in both a deterministic and plastic manner with environmental signals to define the resulting heterogeneous life history trajectories, an indication of learning and intelligent behavior.

**Legg, Jason Colin**  
ESTIMATION FOR TWO-PHASE LONGITUDINAL SURVEYS WITH APPLICATION TO THE NATIONAL RESOURCES INVENTORY (2006)

Many longitudinal surveys can be represented as two-phase samples, where the entire set of observed units can be considered to be a first-phase sample and the second-phase samples are panels that are observed at times determined by an observation scheme. Common longitudinal schemes such as pure panel, rotating panels, and supplemented panels fit this two-phase sample description. We propose a cell-mean model with a fixed number of time points and panels where the model links the vector of second-phase panel means to the vector of time point population means. Covariance matrix estimation techniques that rely on fitting theoretical autocovariance functions to empirical covariances using nonlinear least squares are presented. A method for pooling covariance estimators across partially overlapping panels is described. The estimated generalized least squares estimator (EGLSE) is proposed for the vector of time means. Given a consistent first-phase replication variance estimator, the properties of a consistent replication estimator for the variance of the EGLSE are derived. A central limit theorem for the mean vector is given for the EGLSE under stratified fixed-rate second-phase sampling. We examine weight adjustments and imputation procedures for creating an output dataset that reflects the EGLSEs for key variables. Weight adjustment through regression estimation is proposed for a dataset containing a panel that is always observed and the replication variance estimator is extended to the regression estimator. For constructing a complete dataset, we consider imputation methods where the imputed values are chosen so that the weighted total equals the EGLSE. Results are illustrated using the National Resources Inventory, which has a supplemented panel design.

**Leyva-Estrada, Norma**  
STATISTICAL INFERENCE FOR PARTICLE SYSTEMS FROM SIEVING STUDIES (2006)

This dissertation considers several aspects of inference from particle sieving data. Such data comprise interval-censored particle sizes, and weight fractions of particles in each size interval. Under a model of random sampling of particles up to a target total weight, a sample of particles can be described using renewal theory, and the asymptotic distribution of the empirical weight fraction vector is multivariate normal. The model assumptions are that the particle size distribution being sampled has a standard probability density and that the first two moments of the conditional distribution of weight given size can be described with a power law relationship. Maximum likelihood and Bayesian point and interval estimates for
population weight fractions in each size interval are possible. The properties of maximum likelihood estimators are studied via simulation and Bayes analyses for one-sample and hierarchical data structures are illustrated. The case of lognormal size is used in these simulations. The design problem associated with inferences in this model is also considered. The focus is on identifying sieve configurations that can be expected to allow effective statistical estimation of important parameters of the particle system.

**Li, Xiaoxi**
APPLICATIONS OF NONPARAMETRIC REGRESSION IN SURVEY STATISTICS (2006)
Systematic sampling is a frequently used sampling method in natural resource surveys, because of its ease of implementation and its design efficiency. An important drawback of systematic sampling, however, is that no direct estimator of the design variance is available. We propose an estimator of the model-based expectation of the design variance, under a nonparametric model for the population. The nonparametric model is sufficiently flexible that it can be expected to hold at least approximately for many practical situations. We prove that the nonparametric variance estimator is both a consistent estimator for the model-based expectation of the design variance and a consistent predictor for the design variance in the model-based context. This variance estimator’s properties are further explored through a simulation study. An application in Forest Inventory and Analysis (FIA) is discussed in the second chapter. We compare the nonparametric variance estimator with the variance estimators for random stratified sampling and simple random sampling. The nonparametric variance estimator performs very well and it also has the advantage of allowing more complex models. A discussion about selecting proper auxiliary variables is also carried out for this application. In the last chapter, we study model averaging in survey estimation. Model averaging is a widely used method as it accounts for uncertainties in model selection. However, its applications in survey estimation are yet to be explored. We propose a model-averaging (MA) regression estimator for the population total. The goal is to provide a method that will work well for a wide range of response variables and situations. Different ways to obtain this estimator are explored through large-scale simulation studies.

**Love, Tanzy**
EXPLORING STATISTICAL METHODS FOR ANALYSIS OF MICROARRAY DATA (2005)
The expansion of molecular biology in recent years has created an increasing amount of data and interest in specific tools to analyze them. Much of these data come from a class of high-throughput technology that measures hundreds or thousands of variables at the same time. One such high-throughput technology currently in use is microarray technology. The three major objectives in expression analysis are data preprocessing, identifying differential expression, and grouping genes by common behavior. Extracting the useful information on gene expression from the available output is not trivial. The data collection process is quite noisy in that non-biological bias may be introduced at a number of points by the operators or the technology. Identifying differential expression is an important step in reducing the number of variables, p, of interest to a reasonable scale. It requires distinguishing random variation in expression measurements from signal of interest. Most statistical research so far has focused on this problem and many methods exist for making the determination. Finally, grouping genes has biological importance in identifying the purpose of unidentified genes and the interconnections between biological systems. We focus on achieving the first and last of these objectives while using relatively standard methods for the second one.

**Miller, Curtis**
SEARCH FOR LEVEL SETS OF FUNCTIONS BY COMPUTER EXPERIMENTS (2005)
In engineering and other fields, it is common to use a computer simulation to model a real world process. The inputs to a function f represent factors that influence the outcome. The output represents a quantity of interest. Often there will be a specified level L, and the objective is to find the inputs for which output is above L. L may be a tolerance level, and the
inputs for which response is larger than $L$ form a tolerance region. We might estimate the tolerance region by evaluating $f$ on a grid, but even a coarse grid may have thousands of points in four or five dimensions. If the function $f$ is costly to evaluate, we need to be able to estimate the tolerance region with as few evaluations as possible. We approach this problem with a sequential search. Use data at any stage to fit a spatial process that approximates the function. Fit a Gaussian spatial process, as described in Currin, Mitchell, Morris, and Ylvisaker [1991]. The spatial process gives an estimate of the $L$-contour. We can also use the process to estimate how much information would be gained if $f$ is evaluated at point $p$. Choose points where it is estimated that $f$ takes value $L$, but where uncertainty is high. Evaluate $f$ at the chosen points. This will augment the set of data points and the vector of data values. Repeat the procedure with this augmented data. Calculate convergence criteria after each iteration, and stop when criteria reach predetermined goals.

The search process is applied to several functions defined in low dimensional space. Finally, it is applied to an actual simulation function.

**Mukhopadhyay, Pushpal**

EXTENSIONS OF SMALL AREA MODELS WITH APPLICATIONS TO THE NATIONAL RESOURCES INVENTORY (2006)

The National Resources Inventory (NRI) is a longitudinal survey of non federal lands in the US. The objectives of the survey are to produce estimates for variables related to land use, land cover and soil erosion at the national and sub-national level. Three extensions of existing small area models are proposed for estimating soil erosion for counties. A transformed Fay-Herriot model is developed to estimate wind erosion for the counties in Iowa. A soil erodibility index is available from administrative records for each county and is used as the predictor. The response variable is the soil loss as recorded in the 2002 NRI. An iterative approach is proposed to obtain a calibrated small area estimator. The small area estimates and the standard errors are reported. A class of estimators based on local polynomial regression is proposed. The assumptions on the area level regression are considerably weaker than those of standard small area models. Both the small area mean function and the between area variance function are modeled as smooth functions of the area level covariates. A composite estimator that is a convex combination of the direct mean and the predicted mean is used as the small area estimator. The estimator is shown to be asymptotically consistent under mild regularity conditions. An approximation for the mean squared error based on Taylor linearization is developed. An estimation model is developed for the cover and crop management factor (C factor) that can be used for small area estimation for counties. The NRI data set contains a significant proportion of imputed values, where the unobserved values are determined by the sampling design. The variance due to the current imputation procedure is estimated using an explicit imputation model. An existing small area procedure is adjusted for the C factor to reflect the effect of imputed values and is applied to the NRI.

**Recknor, Justin Craig**

NEW METHODS FOR DESIGNING AND ANALYZING MICROARRAY EXPERIMENTS FOR THE DETECTION OF DIFFERENTIAL EXPRESSION (2006)

This thesis is divided into three sections all pertaining to microarray experimental design and analysis. Microarrays are a tool used in biological research which enables scientists to measure the relative level of expression many genes within an organism at the same time. Microarrays have also opened new research areas in statistics which are currently being investigated concerning different aspects of data normalization, experimental design, and analysis. The first chapter entails a comparison of two commonly used experimental designs in two-dye microarray experiments. Both designs are applicable only to experiments containing treatments with two levels. One design is shown to be more powerful when constrained by the number of arrays. Also, mixed model analysis is often used for both designs. With small sample sizes, mixed model analysis is shown to give inaccurate results under certain conditions. Due to this problem, an alternative method of analysis is proposed.
for both experimental designs which eliminates this concern. Two-dye microarray experiments require special consideration in design since they have multiple random effect in the model. This is because arrays are usually viewed as a random factor that should always be contained in a model for the data. Research has been done on comparing two-dye microarray experimental designs by requiring calculation of array differences. This is shown to inhibit the power of the analysis by removing inter-block information. There are also experimental designs that are viable options which can not be compared using this method. An alternative method of analysis is proposed which allows for multiple random effects in the model. Under certain conditions, this method is shown to choose designs that either would not be chosen, or cannot be considered, when using methods based on array differences. The third chapter discusses new methods for analyzing microarray experiments by categories. Most commonly, microarray analysis is performed on a gene-by-gene basis with the goal of finding the genes whose expression differ the greatest between varieties of treatments. However, scientists often would like to know what aspect of cell life is affected most by differences in varieties. There could be cases where a group of genes pertaining to the same task are all have a mild change in expression which would not be found using gene-by-gene analysis. Two different resampling based methods are proposed for solving this problem. Both methods are compared and results are visualized on a directed acyclical graph.

Wang, Dong
NEW ASPECTS OF STATISTICAL METHODS FOR MISSING DATA PROBLEMS, WITH APPLICATIONS IN BIOINFORMATICS AND GENETICS (2006)

As missing data problems become more commonplace in biological research and other areas, a method with relaxed assumptions while flexible enough to accommodate a wide range of situations is highly desired. We propose a nonparametric imputation method for data with missing values. The inference on the parameter defined by general estimating equations is performed using an empirical likelihood method. It is shown that the nonparametric imputation method together with empirical likelihood can reduce bias and improve efficiency of the estimate relative to inference using only complete cases of the dataset. The confidence regions obtained by empirical likelihood demonstrate good coverage properties. Since our method is valid under very weak assumptions while also possessing the flexibility inherent to estimating equations and empirical likelihood, it can be applied to a wide range of problems. An example is given using mouse eye weight and gene expression data. Missing data methods are also highly valuable from an experimental design point of view. We proposed a selective transcriptional profiling approach in improving the efficiency and affordability of genetical genomics research. The high cost of microarrays tends to limit the adoption of the standard genetical genomics approach. Our method is derived in a missing data framework, in which only a subset of objects are subjected to microarray experiments. It is shown that this approach can significantly reduce experimental cost while still achieving satisfactory power. To address the need for a nonparametric method, we developed empirical likelihood based inference for multi-sample comparison problems using data with surrogate variables. By applying this result to selective transcriptional profiling, we show that the idea of using relatively inexpensive trait data on extra individuals to improve the power of test for association between a QTL and gene transcriptional abundance also applies to the empirical likelihood based method.

Wang, Yaqin
ESTIMATION OF ACCELERATED FAILURE TIME MODELS WITH RANDOM EFFECTS (2006)

Correlated survival data with possible censoring are frequently encountered in survival analysis. This includes multi center studies where subjects are clustered by clinical or other environmental factors that influence expected survival time, studies where times to several different events are monitored on each subject, and studies using groups of genetically related subjects. To analyze such data, we propose accelerated failure time (AFT) models based on
lognormal frailties. AFT models provide a linear relationship between the log of the failure time and covariates that affect the expected time to failure by contracting or expanding the time scale. These models account for within cluster association by incorporating random effects with dependence structures that may be functions of unknown covariance parameters. They can be applied to right, left or interval-censored survival data. To estimate model parameters, we consider an approximate maximum likelihood estimation procedure derived from the Laplace approximation. This avoids the use of computationally intensive methods needed to evaluate the exact log-likelihood, such as MCMC methods or numerical integration that are not feasible for large data sets. Asymptotic properties of the proposed estimators are established and small sample performance is evaluated through several simulation studies. The fixed effects parameters are estimated well with little absolute bias. Asymptotic formulas tend to underestimate the standard errors for small cluster sizes. Reliable estimates depend on both the number of clusters and cluster size. The methodology is used to analyze data taken from the Minnesota Breast Cancer Family Resource to examine age-at-onset of breast cancer for women in 426 families.

**Wang, Yurong**  
ADVANCED STATISTICAL METHODS FOR ANALYSIS OF NDE DATA (2006)

Nondestructive Evaluation (NDE) is a quality-ensuring technique widely used in modern industry. For example, ultrasonic inspection is a routine NDE method to detect flaws/defects in rotating components of jet engines. However, there are random factors that can affect the performance and reliability of NDE systems. Probability of detection (POD) is an important metric for quantifying NDE capability and reliability. The most commonly used POD assessment method is known as the $\alpha$ versus $\alpha$ method. However, the standard $\alpha$ versus $\alpha$ method can not be directly applied to some new modern NDE applications. The objective of this research is to (1) extend the $\alpha$ versus $\alpha$ method to handle bivariate response allowing for data censoring and truncation. (2) extend the standard method to adjust for bias in POD estimates due to flaw sizing errors. (3) develop a more complete understanding of inspection variability by identifying and quantifying the variance components in NDE operations. In Chapter 1, the standard $\alpha$ versus $\alpha$ method is extended to handle bivariate responses allowing for data censoring and truncation. In addition, for one inspection data, extra modelling efforts were made to accommodate the flaw misses that could not be directly accounted for by the bivariate $\alpha$ versus $\alpha$ model. In Chapter 2 of this thesis, we develop two statistical models for adjusting for bias in POD estimates that is caused by flaw sizing errors. We present the results of simulation studies that show how the use of our models will reduce flaw-sizing bias and we demonstrate the use of the methods with simulated inspection data based on the collected real inspection data. There are strong needs to identify and quantify variability sources in NDE applications, as such information is needed to properly decide on strategies to reduce inspection variability and thus to improve inspection quality. In the Chapter 3 of this thesis, we develop the Bayesian hierarchial model to identify and quantify the variance components of inspection in the presence of data censoring. The Bayesian approach is demonstrated with simulated data and experimental data. The computations use MCMC simulation implemented in the in WinBUGS software.

**Wu, Han**  
POISSON PROCESS MODELS FOR A COMBINATION OF POINTS AND COUNTS IN SPACE (2006)

A spatial point process is a stochastic model determining the locations of events in some region $A$. Events may be nests in a breeding colony of birds, trees in a forest, or cities in a country. One goal of spatial statistics is to model the underlying process and thus interpret a complicated point process through some parameter estimates based on the known locations of events from some spatial point processes. Techniques have been developed for estimating the parameters of spatial point process, given data at either the aggregate or point levels. However, it remains unclear how to model aggregate data (i.e., counts for sections) with a
subset of point data (i.e., exact locations of some events). This study investigates a nonhomogeneous Poisson process on A with intensity function. The intensity function may depend on some spatial variable, spatial location s alone, or both. We propose a model for a mixture of an aggregate and point data to accommodate both aggregate level and point level information if possible. It turns out that the proposed model for combined data forms is useful if spatial covariates are available. The combined model appears to give better estimates of parameters in the intensity than does a model only based on aggregate (i.e., count) data. The study shows that the more exact locations we know the more precise maximum likelihood estimates become for parameters of the underlying process. The asymptotic properties of maximum likelihood estimator of the parameters of the combined model are also studied.

Xu, Xia

TOXICOKINETIC-BASED SURVIVAL MODEL FOR ANALYSIS OF TOXICITY DATA WITH CHANGING DOSE (2006)

In toxicology studies, some data sets are dose-time-response data with changing doses over time and death/alive as response. We developed a toxicokinetic-based survival model that relates survivorship and bioaccumulation. The model assumes toxicant uptake and elimination follow a single compartment model and the hazard rate is proportional to the internal concentration. Several diagnostics methods were described for this model to check assumptions of proportional hazard and the functional form of covariates. Maximum likelihood and least square estimation were compared by comparing the estimating equations and a simulation study. The results showed that maximum likelihood is the most unbiased and efficient estimation method for this model.

Zhai, Dongmei

CONTINUOUS-TIME BLOCK-ORIENTED NONLINEAR MODELING WITH COMPLEX INPUT NOISE STRUCTURE (2005)

The continuous-time closed-form algorithms to sinusoidal input changes are proposed and presented for single-input, single-output (SISO) Hammerstein and Wiener systems with the first-order, second-order, and second-order plus lead dynamics. By simulation on theoretical Hammerstein and Wiener systems, the predicted responses agree exactly with the true process values. They depend on only the most recent input change. The algorithms to SISO Hammerstein and Wiener systems can be conveniently extended to the multiple-input, multiple-output (MIMO) systems as shown by the two-input, two-output examples and demonstrated by the simulated seven-input, five-output continuous stirred tank reactor (CSTR). The predictions and the simulated theoretical responses agree exactly and the predicted multiple CSTR outputs are close to the true process outputs. The proposed algorithms can predict the responses closer to the true values when comparing with the piecewise step input approximation of the sinusoidal input changes on a simulated MIMO CSTR. In addition, as the noisy process input could be decomposed as summation of sinusoidal signals imposed on a step input change; the proposed algorithms can be employed to predict outputs for the noisy process inputs once the decomposition is done and the predicted noisy process outputs are shown to be close to the true ones, and are much better than the predictions based on the perfect filtering of the input signals.

The estimating equations based on the moment method are proposed for the Wiener dynamic process with stochastically correlated process input disturbances or noises and they work well for the parameter estimation. No one has ever proposed such method before. This approach has led to stable and robust estimators that have reasonable estimation errors and there is no need to measure the input disturbances or noises, or to calculate the time derivative of the observed output variable. Only the original process output observations over time are needed. The original model can be shifted to an approximate model under some conditions. This approximation is acceptable based on some analysis and derivation. The estimating equation methodology was shown to work well for the approximate model, while other existing methods do not work at all.
Although time to event data is traditionally analyzed assuming independent responses, it is common to encounter correlated time to event data in the form of repeated measurements on subjects or clusters of subjects formed by genetic or social relationships. The objective of this research is to develop estimation procedures for clustered survival data that improve efficiency in estimating regression coefficients in Cox proportional hazards model without imposing overwhelming computational burdens. A commonly used method for clustered survival data obtains parameter estimates from the partial likelihood score equations based on a model that incorrectly assumes independent observations. This independent working model (IWM) approach provides consistent estimators with asymptotic Gaussian distribution and a robust covariance estimator provides a consistent estimator of the covariance matrix of the parameter estimates. The availability of the software in most statistical packages has led to the wide use of this methodology for correlated survival data. Because of the potential loss of efficiency when within cluster correlation is strong, we examine two alternative methods to improve efficiency. We first considered a simplified approach to estimate weights in the weighted estimating equations proposed by Cai and Prentice (1997). This approach reduces the computational burden of the Cai and Prentice methodology. We also consider a new set of weighted estimating equations obtained by inserting weight matrices into the IWM score equations in a different manner. Another set of estimating equations is developed by applying a generalized estimating equation (GEE) approach using approximate Poisson distributions for counting process differentials. The bootstrap procedure is used to estimate the covariance matrix of the parameter estimates. Simulation studies are used to assess bias, variance and relative efficiency of the proposed estimators. Results show that the biases of all of the estimators are small and comparable, but there may be substantial gains in efficiency by incorporating weight matrices into estimating equations when the within cluster correlation is strong and the censoring rate is low. Simulation studies confirm that the bootstrap procedure provides accurate standard errors for estimates of regression coefficients and confidence intervals with appropriate coverage probabilities.

Military bases that have been used for weapon-testing and training usually are contaminated with unexploded ordinance (UXO). These sites can be returned to public use only after UXO remediation. The cleaning-up procedure is usually very expensive and time-consuming. This demands statistical tools to provide more effective sampling strategy and to characterize the UXO distribution. Based on the physical characteristics of UXO deposition, we adopt a simplified Neyman-Scott process to model the UXO distribution. A line transect survey is used to collect data on one coordinate of individual object locations. Two-stage (global and local) sampling strategy is applied to screen the contaminated site. In the global sampling, the estimators of the cluster intensity, mean cluster size and cluster dispersion are provided. The theoretical variance estimators of all the cluster parameters are also given. Simulation studies show that all the parameter estimates perform well and their theoretical variance estimates are reasonably close to their corresponding sample variances. In the local sampling, an inclusion region for covering all the unobserved objects in a cluster is proposed. Its asymptotic coverage property is given and proved. Simulation studies show the actual coverage of the inclusion region is very close to the nominal level.
PUBLICATIONS

Books


Published Research


Sparks, M. E. and **Brendel, V.** (2005) Incorporation of splice site probability models for non-canonical introns improves gene structure prediction in plants. *Bioinformatics, 21 Suppl. 3*, iii20-iii30.


**Book Chapters**


Encyclopedia Entries


Proceedings and Reports


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**Book Reviews**


EDITORSHIPS

ADAMS, DEAN C.
Assoc. Ed./Editorial Board, Herpetologica (2004-07)

ATHREYA, KRISHNA
Assoc. Ed./Editorial Board, Indian Academy of Sciences Journals, Mathematical Sciences (1999-Present)

CARAGEA, PETRUTA C.

CARRIQUIRY, ALICIA L.
Editor, Bayesian Analysis (2003-06)
Editor, Statistics Surveys (2005-06)
Editor, Statistical Science (1998-06)

COOK, DIANNE

DIXON, PHILIP
Assoc. Ed./Editorial Board, Computational Statistics (2003-Present)

KAISER, MARK S.

LAHIRI, SOUMENDRA N.
Assoc. Ed./Editorial Board, Statistical Methodology (2003-Present)
Assoc. Ed./Editorial Board, Sankhya (2004-Present)

LARSEN, MICHAEL D.
Newsletter of the Classification Society of North America (2005)
LORENZ, FREDERICK
Assoc. Ed./Editorial Board, Rural Sociology (2000-05)

MAITI, TAPAS

MEEKER JR., WILLIAM Q.
Guest Editor, Accelerated Testing (special issue), Journal of Statistical Planning and Inference (2006-07)
Editorial Board, Lifetime Data Analysis (2001-Present)
Advisory Editor, Quality Technology & Quality Management (2003-Present)

MORRIS, MAX
Assoc. Ed./Editorial Board, Radiation Research (1992-05)

NETTLETON, DAN
Assoc. Ed./Editorial Board, Biometrics (2005-06)

SHELLEY II, MACK C.
Assoc. Ed./Editorial Board, TESOL Quarterly (2002-05)

STEPHENVON, W. ROBERT

VARDEMAN, STEPHEN B.
Assoc. Ed./Editorial Board, Naval Research Logistics (2003-06)

WU, HUAIQING
PROFESSIONAL ACTIVITIES

Offices & Committee Work for National Organizations

CARAGEA, PETRUTA

CARRIQUIRY, ALICIA L.
Chair, ASA, Task Force on Graduate Education in Statistics in Vietnam. (2005-06).
Institute of Mathematical Statistics (IMS), Committee on Meetings and Joint Meetings Advisory Committee. (2001-05).
Member, Institute of Mathematical Statistics, Executive Committee. (2003-05).
National Academy of Sciences, Committee on Gender Differences in the Careers of Science, Engineering and Mathematics Faculty. (2004-06).

COOK, DIANNE
Program Committee, Workshop on “Visualization of Uncertain Information” sponsored by the National Security Agency, National Research Council, Division of Engineering and Physical Sciences, Board on Mathematical Sciences and their Applications. (2005).

DIXON, PHILLIP M.
Member, ENAR Student Travel Award Committee. (2004-present).
Vice-Chair, ASA, Committee on Archives and Historical Materials. (2004-05).
Chair, ASA, Statistical Consulting Section. (2006)

HOFMANN, HEIKE

ISAACSON, DEAN L.
KOEHLER, KENNETH J.
Chair, ASA, Caucus of Academic Representatives.  (2006-07).
Exam Leader for AP Statistics reading, College Board.  (2005-06).
Chair, AP Statistics Development Committee. College Board.  (2005-08).

LAHIRI, SOUMENDRA N.
Program chair elect, ASA, Section on Nonparametric Statistics.  (2005).

LARSEN, MICHAEL
ASA, Council of Sections Representative, Section on Survey Research Methods.  (2006-08).
National Institutes of Health (NIH) panel, Biostatistical Methods and Research Design (BMRD) program.  (2005-06).
Newsletter Editor and Board Member, Classification Society of North America Newsletter.  (2005-present).

MAITRA, RANJAN
Member, ASA, Executive Committee, Section on Statistical Computing, and Graphics.  (2002-05).

MEEKER JR., WILLIAM Q.
Chair, ASA, Publications Committee.  (1998-05) (Chair, 2005-06).

MORRIS, MAX D.
Member, National Academy of Science, Survivability and Lethality Review Panel (Army Research Laboratory).  (2002-06).

NETTLETON, DANIEL S.
Member, NSF-sponsored Maize Oligonucleotide Array Project Advisory Committee.  (2004-06).
President, ASA, Iowa Chapter.  (2006-07).

NUSSER, SARAH M.
Chair Elect and Chair, ASA, Survey Research Methods Section Executive Committee.  (2004-05).
Member, ASA (SRMS), Behavioral Risk Factor Surveillance System Advisory Group to the CDC.  (2001-05).
Member, ISI International Association of Survey Statisticians, IASS Council. (2005-08).

Member, National Academies, Social Security Representative Payees Committee. (2005-07).


Member, National Academies Committee on Social Security Representative Payees (2005-07).

Chair, Cochran-Hansen Prize Committee (for young statisticians in developing and transitioning countries), International Association of Survey Statisticians. (2005-07).

OPSOMER, JEAN D.

Chair and past Chair, ASA Section on Statistics and the Environment. (2005-06).

Member of Advisory Panel, National Science Foundation, Methodology, Measurement, and Statistics Program. (2005-08).

Member, ENAR Student Paper Award Committee. (2004-06).


Reviewer on two external expert reports commissioned by National Academies of Sciences panel evaluating the American Community Survey. (May 2006).

Member of Scientific Committee for ISI Satellite Conference on Small Area Estimation, Pisa, Italy. (September 2007).


Member of Scientific Committee for International Seminar on Nonparametric Inference, in La Coruña, Spain. (July 2005).

ROLLINS, DERRICK

Faculty Advisor to the NSF Program for the Production of African American PhDs in the Mathematical Sciences. (2001-present).


Chaired the Biochemistry Session at The Annual Meeting for NOBCChE, Los Angeles, California. (2006).

Session Co-chair, 10C13 Optimization and Control of Hybrid Systems, AIChE Annual Meeting, Indianapolis, IN. (2005).

SHELLEY II, MACK C.
Reviewer of proposals for University Council for Educational Administration, University Annual Conference. (2005).

SHERMAN, PETER J.
Member, Third Symposium on Fluctuations and Noise, of the SPIE-2005 Conference, Technical Program Committee Member. (2005).

STEPHENSON, W. ROBERT
Member, ASA, Advisory Committee on Teacher Enhancement. (2004-06).
Member, ASA, Publications Committee. (2004-06).
Member, ASA, Section on Statistical Education Fellows Committee. (2003-05).
Member, Mu Sigma Rho, the National Statistics Honor Society, Board of Directors. (1997-07).

VARDEMAN, STEPHEN B.
Member, American Society for Engineering Education, Meriam/Wiley Distinguished Author Award Committee. (2004-06).
Member, Technometrics Management Committee (ASQ Representative). (2003-08).
Member, Council of Presidents of Statistical Societies, Presidents' Award Committee. (2006-08).

WU, HUAIQING
Youden Award Judge and Issue Nominator, Technometrics Prizes. (2005).

**Papers Presented, Lectures & Seminars**

ADAMS, DEAN C.


ATHREYA, KRISHNA


Short course on ‘Measure theory.’ Department of Mathematics, Karnatak University. Dharwad, India. 2005.

Colloquium speaker. ISI, Bangalore, India. 2006.


Invited speaker. IISA Conference. Cochin, Kerala, India. 2006.

BAILEY, THEODORE B.


CARAGEA, PETRUTA C.


**CARRIQUIRY, ALICIA L.**


“An introduction to Bayesian data analysis.” CDC. Atlanta, GA. 2006.


**CHEN, SONG X.**


**COOK, DIANNE**


**DIXON, PHILIP**

“Combining information to estimate the probability of a rare event.” Winona State University and University of Wisconsin. La Crosse, WI.  2005.

**DORMAN, KARIN**


**EVANS, RICHARD**


“Robust evaluation of continuous diagnostic tests.” Department of Biostatistics, University of Iowa. Iowa City, IA. 2006.


FROELICH, AMY G.


“Materials for assessment of engaging students in statistical discovery.” Department of Statistics and Actuarial Science, University of Iowa. Iowa City, IA. 2006.


GENSCHEL, ULRIKE


“Weibull confidence bounds with few or zero failures.” Joint Statistical Meetings, ASA. Minneapolis, MN. 2005.

HOFMANN, HEIKE


“Boom and bust of high-tech industry at the turn of the millennium - data challenge.” InfoVis. Minneapolis, MN. 2005.


KAISER, MARK S.


KOehler, Kenneth J.


LAHIRI, SOUMENDRA N.


“Asymptotic expansions for sums of block variables, with applications.” Colloquium talk. Department of Mathematics, University of Southern California, LA. Los Angeles, CA. 2006.

“Block bootstrap for spatial regression models based on irregularly spaced spatial data. Colloquium talk.” Department of Statistics, Texas A&M University. College Station, TX. 2006.


LARSEN, MICHAEL D.


LIU, PENG


“Quick calculation of sample size while controlling false discovery rate with application to microarray.” Joint Statistical Meeting. Seattle, WA. 2006.


“Why shrinking the variance estimates helps the multiple testing for a large number of populations such as genes?” Joint Statistical Meetings. Minneapolis, MN. 2005.

LORENZ, FREDERICK O.


MAITI, TAPS


“Neural network imputation: an experience with the National Resources Inventory survey.” Joint Statistical Meetings. Seattle, WA. 2006.


MAITRA, RANJAN


MARASINGHE, MERVYN G.


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“A statistical model for linking field and laboratory exposure results for a model coating.”
4th International Conference on Service Life Prediction. Key Largo, FL. 2006.

“Bayesian optimal planning for accelerated life tests.” International Society for Bayesian

“Development of a test plan for repeated measures degradation data.” Design and
Analysis of Experiments Conference. Santa Fe, NM. 2005.

“Reliability data analysis experiences.” Chicago Chapter of the American Statistical

“Sensitivity analysis to assess the effects of misses in the estimation of POD from field
inspection data.” Quantitative Nondestructive Evaluation Conference. Portland, OR.
2006.

“Statistical methods for accelerated testing.” Short course, Hewlett Packard. Corvallis,
OR. 2006.

2006.

“Statistical methods for evaluating probability of detection.” Short course, ISU Center for


“Statistical methods for reliability data.” Short course, Eaton Corporation. Pittsburgh,
PA. 2005.

“Statistical methods for reliability data.” Short course, National University of San Marcos.
Lima, Peru. 2006.

“Using accelerated life tests results to predict field reliability.” Plenary talk, International

“Using accelerated tests to predict service life of materials subjected to out-door

“Using simulation and graphics as an aid in planning complicated experiments.”
International Society for Business and Industrial Statistics 5 Conference. Lima, Peru.
2006.

“Using simulation and graphics as an aid in planning complicated experiments.” Joint

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MORRIS, MAX

“An application of orthogonal arrays of strength 2 in the sensitivity analysis of computer

NETTLETON, DAN

“Cluster analysis for microarray data.” Plant Microarray Short Course on Design and

“Discussion of “Hidden Markov models for microarray time course data in multiple
biological conditions” by Yuan and Kendziorski.” Joint Statistical Meetings.
Minneapolis, MN. 2005.


“Introduction to statistical design and analysis of microarray experiments.” Plant Breeding Lecture Series on Data Analysis Innovations Contributing to Crop Improvement, Iowa State University. Ames, IA. 2006.

“One-day short course on introduction to statistical design and analysis of microarray experiments.” ENAR Meeting. Tampa, FL. 2006.


“Two-day short course on introduction to statistical design and analysis of microarray experiments.” Iowa State University. Ames, IA. 2005.

“Using p-values for the planning and analysis of microarray experiments.” Department of Biostatistics and Medical Informatics Seminar, University of Wisconsin. Madison, WI. 2005.


NORDMAN, DAN


NUSSER, SARAH M.


OPSOMER, JEAN D.


“Recent advances in nonparametric and semiparametric estimation.” Joint Statistical Meetings, ASA. Minneapolis, MN. 2005.


POLLAK, EDWARD


ROBERTS, CARL W.


“Modalizing the link: On measuring the social construction of ‘the possible,’ ‘the impossible,’ ‘the inevitable,’ and ‘the contingent.’” Greenlee School of Journalism and Communication, Iowa State University. Ames, IA. 2006.

“Modalizing the link: On measuring the social construction of ‘the possible,’ ‘the impossible,’ ‘the inevitable,’ and ‘the contingent.’” International Communication Association Conference. Dresden, Germany. 2006.


ROLLINS, DERRICK


“Block-oriented exact solution technique (BEST).” Seminar: Department of Chemical & Biomolecular Engineering, University of California. Los Angeles, CA. 2006.


“Sound statistical inference in engineering and science.” Seminar: Department of Chemical and Biological Engineering, Iowa State University. Ames, IA. 2006.


SHELLEY II, MACK C.


“Identifying a model for evaluating architectural and engineering services (A/E) costs.” Iowa State University Department of Facilities Planning and Management. Ames, IA. 2006.


“Movers, stayers, and lifers: A structural equation analysis of the likelihood of spending the rest of your life in your current home community.” Joint Statistical Meetings. Minneapolis, MN. 2005.


“Nutritional supplements, placebo effects, and strength/endurance training: A meta-analysis.” School of Human Movement and Exercise Science, University of Western Australia. Perth, Australia. 2006.


“Quality of life among elderly Iowans and Iowans with disabilities: The needs and satisfactions on aging and disability resources in Iowa.” Midwest Sociological Society Meetings. Omaha, NE. 2006.


SHERMAN, PETER J.


“Quantifying the correlation between tonal noise sources.” 13th International Congress on Sound and Vibration. Vienna, Austria. 2006.
STEPHENSON, W. ROBERT


“Further assessment of materials for engaging students in statistical discovery.”

“Further assessment of materials for engaging students in statistical discovery.”

“Statistics education journals: Cooperating not competing.”


VARDEMAN, STEPHEN B.

“An introduction to Bayesian statistics for industry.”
33rd Annual AICE Conference, ASQ. Davenport, IA. 2006.

WU, HUAIQING

“Analysis of window-observation recurrence data.”

“Analysis of window-observation recurrence data.”
Georgia Institute of Technology.
School of Industrial and Systems Engineering. 2005.

“Analysis of window-observation recurrence data.”

“Fractional factorial designs with admissible sets of clear two-factor interactions.”
Twelfth International Conference on Statistics, Combinatorics, Mathematics and Applications.
Auburn, AL. 2005.

“Fractional factorial designs with admissible sets of clear two-factor interactions.”

YU, CINDY

“A Bayesian analysis of time-changed levy processes of return dynamics.”
Seminar on Bayesian Inference in Econometrics and Statistics, University of Iowa. Iowa City, IA. 2006.

“Estimation of levy jump models under the risk neutral and physical measure using stock and option prices.”
CONTRACTS & GRANTS 2005-06

AIR FORCE RESEARCH LABORATORY/SOLID STATE SCIENTIFIC CORPORATION
Vardeman, Stephen B., PI
Modeling and decision analysis for threat warning based on the time evolution of sensed electromagnetic spectra. 2004-2005.

AMERICAN HEART ASSOCIATION 0350550Z
Koehler, Kenneth J., Co-PI

AMERICAN JUDICATURE SOCIETY AND THE FOUNDATION FOR THE ADVANCEMENT OF AN INDEPENDENT JUDICIARY AND THE RULE OF LAW
Shelley II, Mack C., PI

AMERICAN KENNEL CLUB ACORN GRANT
Evans, Richard, Co-PI
In vitro immunosuppressive effects of metronidazole on mitogen-stimulated canine lymphocyte proliferation. 2006.

AMERICAN PSYCHOLOGICAL ASSOCIATION
Bonett, Doug, Co-PI
An online support group intervention for Asian American lesbians. 2006-2007.

ATLAS MATERIAL TESTING TECHNOLOGY
Meeker, William Q., PI

BOEHRINGER INGELHEIM VETMEDICA, INC
Evans, Richard, Co-PI
Evaluating the performance of diagnostic tests for “meat juice” samples. 2006.

BUREAU OF LABOR STATISTICS
Opsomer, Jean D., PI

CARVER TRUST
Froelich, Amy G., Co-PI
Carver Trust Grant. 2006-2009.

DES MOINES INDEPENDENT COMMUNITY SCHOOL DISTRICT
Shelley II, Mack C., PI

DUXBURY/WADSWORTH/THOMSON PUBLISHING
Larsen, Michael D.,
Internet companion to statistics. 2002-2005.

EGG NUTRITION COUNCIL
Carriquiry, Alicia L., PI
FEDERAL AVIATION ADMINISTRATION

Meeker, William Q., Co-PI

FEDERAL HIGHWAY ADMINISTRATION

Carriquiry, Alicia L., PI
Development of analytical tools to evaluate road departure crashes using naturalistic driving study data. 2006-2008.

HIGHER EDUCATION COMMISSION

Carriquiry, Alicia L., PI
Enabling graduate learning in risk analysis with emphasis on food, agriculture and veterinary medicine. 2006-2008.

HOLD

Evans, Richard
Validation of an objective assessment of lameness and its correlation to hoof disease in Iowa swine herds. 2006.

HYVEE CORPORATION

Koehler, Kenneth J., PI
Research agreement with HyVee Corporation to support development of statistical methodology for food distribution systems. 2006-2007.

IOWA ASSOCIATION OF SCHOOL BOARDS GRANT, WITH FUNDING FROM THE U.S. DEPARTMENT OF EDUCATION

Shelley II, Mack C., Co-PI

IOWA DEPARTMENT OF EDUCATION (ORIGINAL FUNDING FROM MATHEMATICS AND SCIENCE PARTNERSHIPS PROGRAM OF THE U.S. DEPARTMENT OF EDUCATION)

Shelley II, Mack C.,

IOWA DEPARTMENT OF EDUCATION

Shelley II, Mack C., Co-PI
Iowa positive behavioral supports for children and youth. 2002-2006.

Shelley II, Mack C., PI

IOWA DEPARTMENT OF ELDER AFFAIRS

Shelley II, Mack C., PI

IOWA DEPARTMENT OF REVENUE

Vardeman, Stephen B., PI
Research collaboration between tax research and program analysis section, Iowa Department of Revenue and Iowa State University. 2004-2005.

Vardeman, Stephen B., PI and Larsen, Michael D., Co-PI
Research collaboration between tax research and program analysis section, Iowa Department of Revenue and Iowa State University. 2005-2006.
IOWA DEPARTMENT OF TRANSPORTATION
Carriquiry, Alicia L., PI

IOWA STATE UNIVERSITY, CIAG RESEARCH SUPPORT PROGRAM
Dorman, Karin, PI
Building a comprehensive model of pathogen-host interactions during persistent infection. 2004-2006.

ISU CENTER FOR NONDESTRUCTIVE EVALUATION, CONSORTIUM INVOLVING ALLIED SIGNAL PROPULSION ENGINES, GENERAL ELECTRIC AIRCRAFT ENGINES, AND PRATT & WHITNEY.
Meeker, William Q., Co-PI

IOWA STATE UNIVERSITY, COLLEGE OF HUMAN SCIENCES
Larsen, Michael D., Co-PI
Intramural Seed Grant Program.  2006.

Nusser, Sarah M., Co-PI

IOWA STATE UNIVERSITY, COLLEGE OF LIBERAL ARTS AND SCIENCES COMPUTER ADVISORY COMMITTEE
Froelich, Amy G., Co-PI
Small grant for instructional improvement.  2006.

Larsen, Michael D., PI

IOWA STATE UNIVERSITY, COLLEGE OF LIBERAL ARTS AND SCIENCES RESEARCH GRANT
Bonett, Doug, Consultant

IOWA STATE UNIVERSITY, INSTITUTE OF SCIENCE AND SOCIETY
Larsen, Michael D, Maiti, Taps and Opsomer, Jean, Co-PI's
Building a survey framework to close the rural data gap.  2005-2006.

Sherman, Peter J., Co-PI

IOWA STATE UNIVERSITY, OFFICE OF THE PROVOST
Dorman, Karin, Co-PI
Special interdisciplinary seminar on mathematical biology.  2006.

IOWA STATE UNIVERSITY, THE CENTER FOR EXCELLENCE IN LEARNING AND TEACHING
Froelich, Amy G., PI, and Larsen, Michael D., Co-PI

IOWA STATE UNIVERSITY, UNIVERSITY RESEARCH GRANT
Larsen, Michael D., PI
IOWA STATE UNIVERSITY, WOMEN’S ENRICHMENT FUND
Dorman, Karin, Co-PI

JOHN DEERE FOUNDATION
Vardeman, Stephen B., PI

MAYO CLINIC
Larsen, Michael D.
Mayo Clinic Internal Small Grant Award. 2005.

NCHRP 17-35 TRANSPORTATION RESEARCH BOARD
Carriquiry, Alicia L., PI

NATIONAL CENTER FOR HEALTH STATISTICS
Larsen, Michael D., PI

NATIONAL INSTITUTUE OF STANDARDS AND TECHNOLOGY
Meeker, William Q., PI

NATIONAL INSTITUTES OF HEALTH
Evans, Richard, Co-PI

Evans, Richard, Co-PI
Preterm birth, lung innate immunity and RSV. 2005.

Maiti, Taps, PI
Bayesian learning for predicting time to recurrence of prostate specific antigen. 2005-2010.

Maiti, Taps, PI
Improving small area estimates of depression among Africa-Americans. 2006.

Maiti, Taps, PI
Center for rural population surveys. 2006.

NATIONAL INSTITUTES OF HEALTH/ NATIONAL CANCER INSTITUTE
Koehler, Kenneth J., Co-PI

NATIONAL INSTITUTES OF HEALTH, NATIONAL INSTITUTE ON AGING
Lorenz, Frederick O., Consultant

NIH/NIH, TRAINING GRANT
Evans, Richard

NATIONAL INSTITUTES OF HEALTH, NATIONAL INSTITUTE OF ARTHRITIS, MUSCULOSKELETAL, AND SKIN DISEASES
Koehler, Kenneth J., Co-PI
NATIONAL INSTITUTES OF HEALTH, NICHD
Lorenz, Frederick O., PI
Relationship development and health in young adults. 2006-2011.

NATIONAL INSTITUTES OF HEALTH, NATIONAL INSTITUTE FOR ENVIRONMENTAL
HEALTH SCIENCES AND OFFICE OF DIETARY SUPPLEMENTS
Dixon, Philip, Kaiser, Mark S., Co-PI’s

Koehler, Kenneth J., Co-PI

Dorman, Karin, PI

NATIONAL INSTITUTES OF HEALTH, NATIONAL INSTITUTE OF MENTAL HEALTH
Bonett, Doug, Co-PI

Lorenz, Frederick O., Consultant

Lorenz, Frederick O., Co-PI
Critical transitions in rural families at risk. 2006-2010.

NATIONAL INSTITUTES OF HEALTH (SUB-CONTRACT THROUGH JOHNS HOPKINS UNIVERSITY)
Maitra, Ranjan, PI

NATIONAL INSTITUTES OF HEALTH - NATIONAL SCIENCE FOUNDATION
Brendel, Volker, and Dorman, Karin, Co-PI’s
BBSI computational and systems biology summer institute at Iowa State University. 2003-2007.

NATIONAL INSTITUTE OF JUSTICE
Morris, Max, Co-PI

NATIONAL INSTITUTE OF STATISTICAL SCIECINES
Larsen, Michael D., Co-PI

Opsomer, Jean D., Co-PI

NATIONAL SCIENCE FOUNDATION
Adams, Dean C., PI

Brendel, Volker, PI
Cyberinfrastructure for (comparative) plant genome research through plant GDB. 2006-2010.

Brendel, Volker, PI
Genetic mechanisms regulating inflorescence architecture in maize and other cereals. 2006-2011.
Cook, Dianne, Co-PI

Dixon, Philip, Co-PI

Hofmann, Heike, Co-PI

Hofmann, Heike, Co-PI

Isaacson, Dean L., Co-PI

Isaacson, Dean L., Co-PI

Kaiser, Mark S., PI, Isaacson, Dean L., Co-PI
VIGRE in the Department of Statistics at Iowa State University.  2001-2006.

Lahiri, Soumendra N., PI

Larsen, Michael D., PI, Lorenz, Frederick O., Co-PI

Larsen, Michael D.
Development of cutting edge geoscience virtual reality applications for classroom instruction and pedagogical evaluation of the impact on learning of VR technology.  2006-2009.

Nettleton, Dan, Co-PI

Nettleton, Dan, Co-PI

Nettleton, Dan, Co-PI

Shelley II, Mack C., PI

Shelley II, Mack C., Statistician
When science and literacy meet: Creating support for teachers implementing writing in the science classroom.  2006-2011.

Nusser, Sarah M., Co-PI

Nusser, Sarah M., PI

Maiti, Taps, PI
Topics in small area estimation.  2003-2006.
Maiti, Taps, PI
Empirical and hierarchical Bayesian methods with applications to small area estimation. 2006-2008.

NATIONAL SCIENCE FOUNDATION (BCS-BE)
Opsomer, Jean D., Co-PI

NATIONAL SCIENCE FOUNDATION (CAREER AWARD)
Adams, Dean C., PI

Maitra, Ranjan, PI

NATIONAL SCIENCE FOUNDATION, COURSE, CURRICULUM AND LABORATORY IMPROVEMENT PROGRAM
Stephenson, W. Robert, Co-PI

NATIONAL SCIENCE FOUNDATION, DDDAS
Meeker, William Q., Co-PI
Distributed information utilization for managing aging assets comprising electric power systems. 2006-2009.

NATIONAL SCIENCE FOUNDATION (DMS)
Chen, Song X., PI

NATIONAL SCIENCE FOUNDATION (JOINT DMS AND MMS PROGRAMS)
Opsomer, Jean D., Co-PI

NATIONAL SCIENCE FOUNDATION (MEASUREMENT, METHODS, AND STATISTICS PROGRAM)
Larsen, Michael D., PI

Chen, Song X., PI, Opsomer, Jean D., Co-PI

NATIONAL SCIENCE FOUNDATION (RESEARCH TRAINING GRANT)
Carriquiry, Alicia L., PI, Maitra, Ranjan, Meeker, William Q., Vardeman, Stephen B., Wu, Huaiqing, Co-PI’s

NATIONAL SCIENCE FOUNDATION, SBE
Larsen, Michael D., Co-PI
ADVANCE at Iowa State University: Comprehensive institutional intervention strategy. NSF ADVANCE: Increasing the participation and advancement of women in academic science and engineering careers. 2006-2011.
NATIONAL SCIENCE FOUNDATION, SCIENTIFIC COMPUTING RESEARCH ENVIRONMENTS IN THE MATHEMATICAL SCIENCES PROGRAM

Meeker, William Q., PI, Cook, Dianne, Maiti, Taps, Nettleton, Dan, Co-PI's

NATIONAL SCIENCE FOUNDATION (SUBCONTRACT FROM U MAINE)

Nusser, Sarah M., PI

NATIONAL SCIENCE FOUNDATION (SUBCONTRACT TO NISS)

Larsen, Michael D., PI

OFFICE OF NAVAL RESEARCH

Nettleton, Dan, Consultant

PIONEER HI-BRED

Koehler, Kenneth J., PI

PRATT & WHITNEY

Meeker, William Q., Co-PI
Dual angle phased array multiple axis ultrasonic testing system-reliability calculations and inspectability support. 2003-2005.

SHERWIN WILLIAMS COMPANY

Meeker, William Q., PI

SPANISH NATIONAL SCIENCE FOUNDATION

Opsomer, Jean D., Co-PI

THE PETROLEUM RESEARCH FUND, AMERICAN CHEMICAL SOCIETY

Wu, Huaiqing, Co-PI

THOMSON/BROOKS/COLE PUBLISHING

Larsen, Michael D.

U.S. BUREAU OF THE CENSUS

Larsen, Michael D., PI

Nusser, Sarah M., PI
The development of a cognitive model to simulate lister behavior and decision-making for map-based tasks specific to address canvassing. 2005-2006.

Maiti, Taps
Small area estimation. 2006.
U.S. CENSUS BUREAU OF THE CENSUS (VIA NSF)
Chen, Song X., PI
A supplement to NSF SES 0650938, a nonparametric approach to population size estimation for multiple system capture-recapture surveys. 2006-2007.

U.S. DEPARTMENT OF AGRICULTURE, CENTER FOR VETERINARY BIOLOGICS
Koehler, Kenneth J., PI

Koehler, Kenneth J., PI
Research agreement to support development of statistical methodology. 2005-2005.

U.S. DEPARTMENT OF AGRICULTURE COOPERATIVE AGREEMENT WITH THE ECONOMIC RESEARCH SERVICE
Larsen, Michael D., PI, Opsomer, Jean D., Co-PI

U.S. DEPARTMENT OF AGRICULTURE, FOREST SERVICE ROCKY MOUNTAIN RESEARCH STATION, JOINT VENTURE AGREEMENT
Opsomer, Jean D., Co-PI
Nonparametric model-assisted survey estimation for forest resources. 2001-2005.

U.S. DEPARTMENT OF AGRICULTURE, PLANT GENOME PROGRAM
Nettleton, Dan, Co-PI
BarleyBase, a prototype online database for cereal microarrays with integrated tools for data visualization and statistical analysis. 2002-2005.

U.S. DEPARTMENT OF AGRICULTURE, NCR-SARE
Carriquiry, Alicia L., PI
Economic benefits and water quality consequences of ethanol production in the upper Mississippi river basin. 2006-2009.

U.S. DEPARTMENT OF AGRICULTURE, NATIONAL RESEARCH INITIATIVE
Carriquiry, Alicia L., PI
Epidemiologic tools to assess obesity-related energy and other nutrient intake. 2006-2009.

Dixon, Philip, Co-PI

Dixon, Philip, Co-PI
Understanding weed dynamics in contrasting crop rotation systems: combining a pulse/field experiment and matrix models. 2002-2006.

Nettleton, Dan, Co-PI

Nettleton, Dan, Co-PI

Nettleton, Dan, Co-PI
USDA/NRI/CGP/CSREES

Evans, Richard, Co-PI

Evans, Richard, Co-PI

USDA-CSREES NATIONAL RESEARCH INITIATIVE (SUBCONTRACT FROM UNIVERSITY OF MINNESOTA)

Evans, Richard

U.S. DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE

Nusser, Sarah M., PI, Larsen, Michael D., Maiti, Taps, Opsomer, Jean D., Yu, Cindy, Co-PIs
Survey research and support for the National Resources Inventory. 2004-2009.

U.S. DEPARTMENT OF AGRICULTURE (SUBCONTRACT FROM UNIVERSITY OF GEORGIA)

Nettleton, Dan, Co-PI

U.S. DEPARTMENT OF DEFENSE/AIR FORCE RESEARCH LABORATORY

Morris, Max, Co-PI
Modeling and decision analysis for threat warning based on the time evolution of sensed electromagnetic spectra. 2004-2005.

USGS DIVISION OF MIGRATORY BIRD MANAGEMENT

Dixon, Philip, Co-PI

WELLS FARGO

Koehler, Kenneth J., PI
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